

MARINE REVIEW.

Vol. XIII.

CLEVELAND, O., JUNE 11, 1896.

No. 24.

Blue Book of American Shipping.

For some time past it has been the aim of the MARINE REVIEW to put into book form the vast amount of statistical information that has been collected in these columns and to add to it various lists and directories of ships, ship owners, ship builders, etc., together with a large number of engravings of the best quality, illustrating the shipping industry of the United States. This book is now being distributed to subscribers. It is offered for sale in heavy leather binding at \$5. The introduction and table of contents, which follow, will give an idea of the scope of this publication.

"Introduction—Through our intimate relations with the principal concerns engaged in the various branches of lake commerce, and an acquaintance also with coast ship building and shipping interests, during the past six years, we have learned that there is a demand for information regarding these industries that has not as yet been supplied in government records or other directories of limited scope thus far published. This book aims to meet these requirements. An examination will show that it covers ground not as yet occupied by any publication devoted to marine matters, either on the lakes or elsewhere in the United States. It will also be noted that where any line of information previously published is followed, the aim has been to improve the same by additions and by a careful regard for the importance of reliability in every detail.

"The intention of the MARINE REVIEW is to make this publication a standard work, to be revised annually, and it is expected that the knowledge of where and how to obtain the information required will make future issues even more valuable than the present one.

"It was intended originally to give the name Marine Review Year Book to the publication. But as the work progressed it was found that the book would, of necessity, deal very largely with shipping interests all over the country, and especially the ship building industry on the Atlantic coast. On this account, and for the reason also that it is the intention to widen the scope of the publication in 1897, so as to make it as valuable to the coast interests as it is now to the lakes, the name was changed to Blue Book of American Shipping.

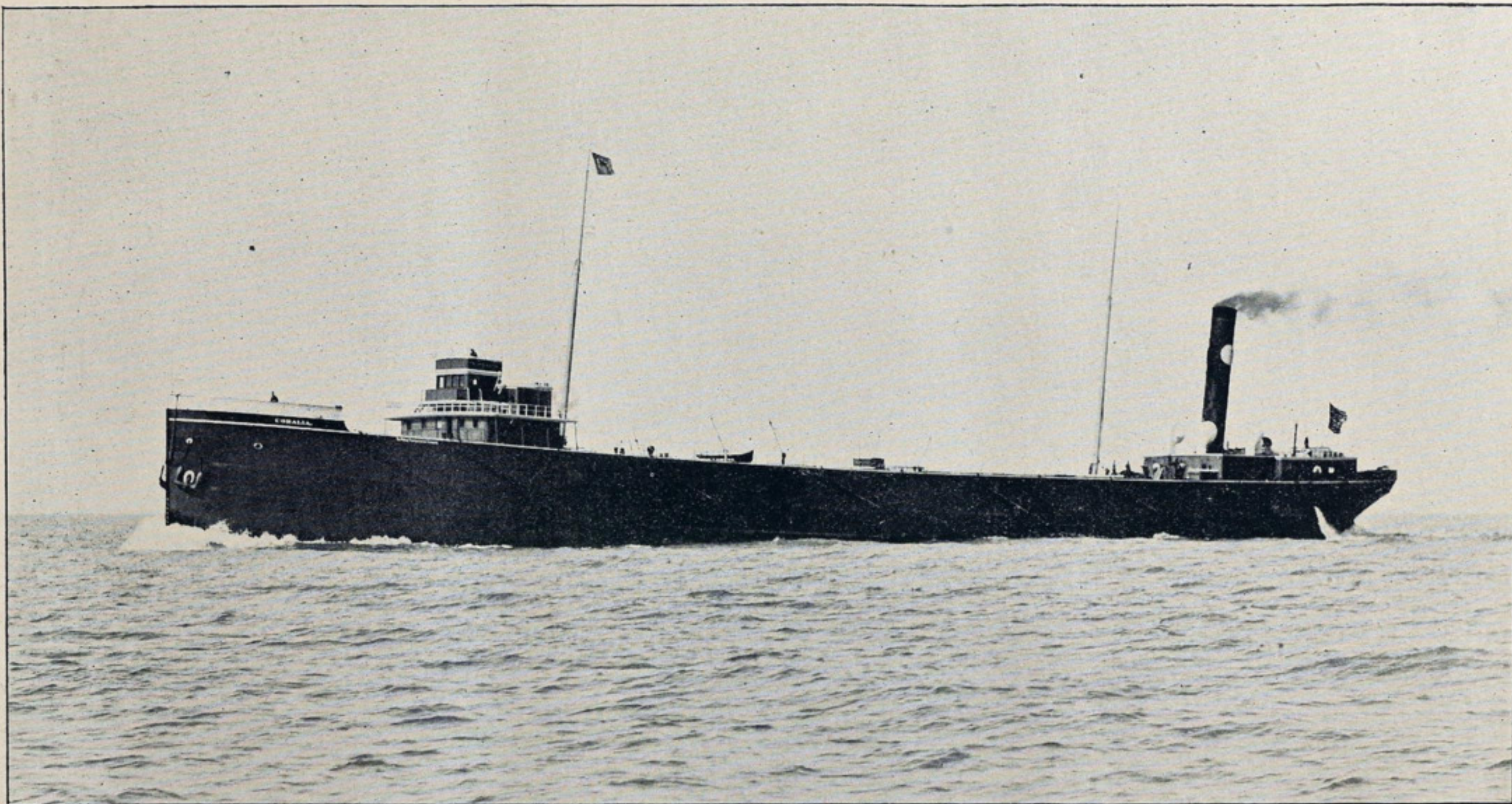
"Patrons of the Blue Book are privileged to ask, at any time during the year, for any information that we may have in hand, or that may be obtained without great difficulty."

TABLE OF CONTENTS—BLUE BOOK OF AMERICAN SHIPPING.

	PAGES
Advertisements	275-322
Advertisers, list of	7-8-9
American Association of Masters and Pilots, including 800 masters and pilots of coast and river steamers	93- 99
American Society of Naval Engineers	137-143
American vessels, steam and sail	11- 48
Bridges, in lake ports, giving clear width through draws	243-244
Canada's merchant shipping	227
Canadian vessels, steam and sail	49- 63
Canals connecting with the great lakes	235-239
Cargoes, largest carried by lake steamers	227
Carrying charges for twenty years past on coarse freight	229-230
Classified directory of marine business concerns in United States	257-269
Cylinder sizes of lake engines, names and particulars of vessels built on the lakes during winter of 1895-6	200-201
Dimensions of notable Atlantic liners	202
Directory of marine business concerns	257-275
Docks, particulars of and unloading equipment, Lake Erie ports	215-21
Dry docks of the United States	75- 80
Dry Docks on the lakes, dimensions of	240
Engineers of the U. S. Navy, names and addresses of 500 men	137-143
Engineers, (marine), names and addresses of 3,150 on coast and river steamers	101-126
Erie canal, particulars of	235-239
Fleets of lake vessels, owners' names and addresses	69- 70
Freight charges, average during past twenty years	229-230
Freight rates of lake vessels and trunk lines, comparison	232
Furnaces using Lake Superior ore	218
Grain trade of the lakes	228
Illustrations, list of	6
Illustrations of coast steamers	185-189
Illustrations of representative steamers of the modern lake fleet	148-184
International Deep Waterways Association	233-234
Iron ore production, Lake Superior region	205-210

Knots of all kinds	253
Lake Carriers' Association—over 700,000 tons of lake vessels controlled by members	81- 83
Marine engine, details and names of parts	195
Marine Engineers' Beneficial Association, with names and addresses of 1,750 members on coast and river steamers, and 1,400 on lake steamers	101-126
Masters and pilots, names and addresses of 1,300 on coasts, lakes and rivers	86- 99
Modern lake steamers, particulars of hull and machinery	146-147
Names and addresses of concerns owning fleets of coast vessels	65- 68
Names and addresses of concerns owning lake vessels	69- 70
Naval Architects and Marine Engineers, names and addresses of 600 men comprising the ship and engine building business of the United States	127-136
Opening and closing of navigation, at Sault, Duluth, Mackinaw, Welland canal, Buffalo and Erie canal	231
Operating expense of ten lake steamers	198
Ore unloading plant, description	256
Particulars of hulls and machinery of some modern lake steamers	147-148
Performances of fifteen lake steamers, from mechanical tests	196-197
Population of lake cities	204
Portage lake canal commerce	223
Port directory of advertisers in Blue Book and Marine Review	270-275
Purchasing agents of the principal vessel owning companies in the United States, lakes, coast and rivers	65- 74
Purchasing agents of 500 American passenger steamers—(See pages 65-70 also)	71- 74
Regulations for vessels passing through St. Mary's river, St. Mary's Falls canals, American and Canadian, and St. Clair Flats ship canal	246-252
Rope, manilla, weight and strength of	315
Ship and engine builders, and dry docks of the United States	75- 80
Ship building, history of and description of plants	190-193
Ship building, statistics of vessels built on the great lakes	224-227
Ship Masters' Association, comprising 500 masters of the largest vessels on the great lakes	86- 90
Size and depths of great lakes	203-204
Society of Naval Architects and Marine Engineers	127-136
Statistics in general of lake shipping	203-232
St. Clair Flats ship-canal regulations	251-252
St. Lawrence canals, particulars of	235-239
St. Mary's Falls canal, statistics of—Lake Superior commerce	219-222
St. Mary's river and canal, American and Canadian regulations	246-252
Suez canal and St. Mary's Falls canal, comparison of commerce	223
Table of contents	5
Transfers of vessel property to May 1, 1896	48
Twenty-foot channel, chart of	245
United States court officials	232
U. S. life saving stations on the lakes	242
Value of business fleet of the lakes	226
Vessels on the great lakes, particulars of, with name and business address of owner	11- 63
Vessels owned on the Atlantic and Pacific coasts	65- 68
Waterways from lakes to seaboard	235-239
Weather signals, United States and Canadian	241

Few of the patrons of the Detroit & Cleveland Steam Navigation Co., who ride on the big steamers City of Detroit and City of Cleveland by night, have any idea of the care that is taken on these steamers to guard against accidents even of a most trivial kind. If the night is at all dark or the weather in the least unfavorable, these big steamers, when working down the Detroit river in the vicinity of the Lime-Kilns crossing and Amherstburg, where the channels are shallow, are checked down so that they are barely kept under headway, and they are made to creep along the deepest parts of the channels with as much care as though the life of every passenger was dependent upon avoiding even a slight scrape on the side of the cuts. It is not at all probable that an accident in these river channels would result in loss of life, but the officers of the steamboat line are so jealous of their reputation that they guard against even a report of the slightest grounding in such places. Big freight steamers, deeply laden, pass through these channels with some care, but with no such cautious movements as are noticed on the passenger ships.



Built by the Globe Iron Works Company.

Copyrighted 1896.

Supplement to MARINE REVIEW, Vol. 13, No. 21, May 21, 1896.

HULL : 432 feet over all.
412 " keel.
48 " beam.
28 " deep.

STEEL STEAMER CORALIA—LARGEST ON THE LAKES.

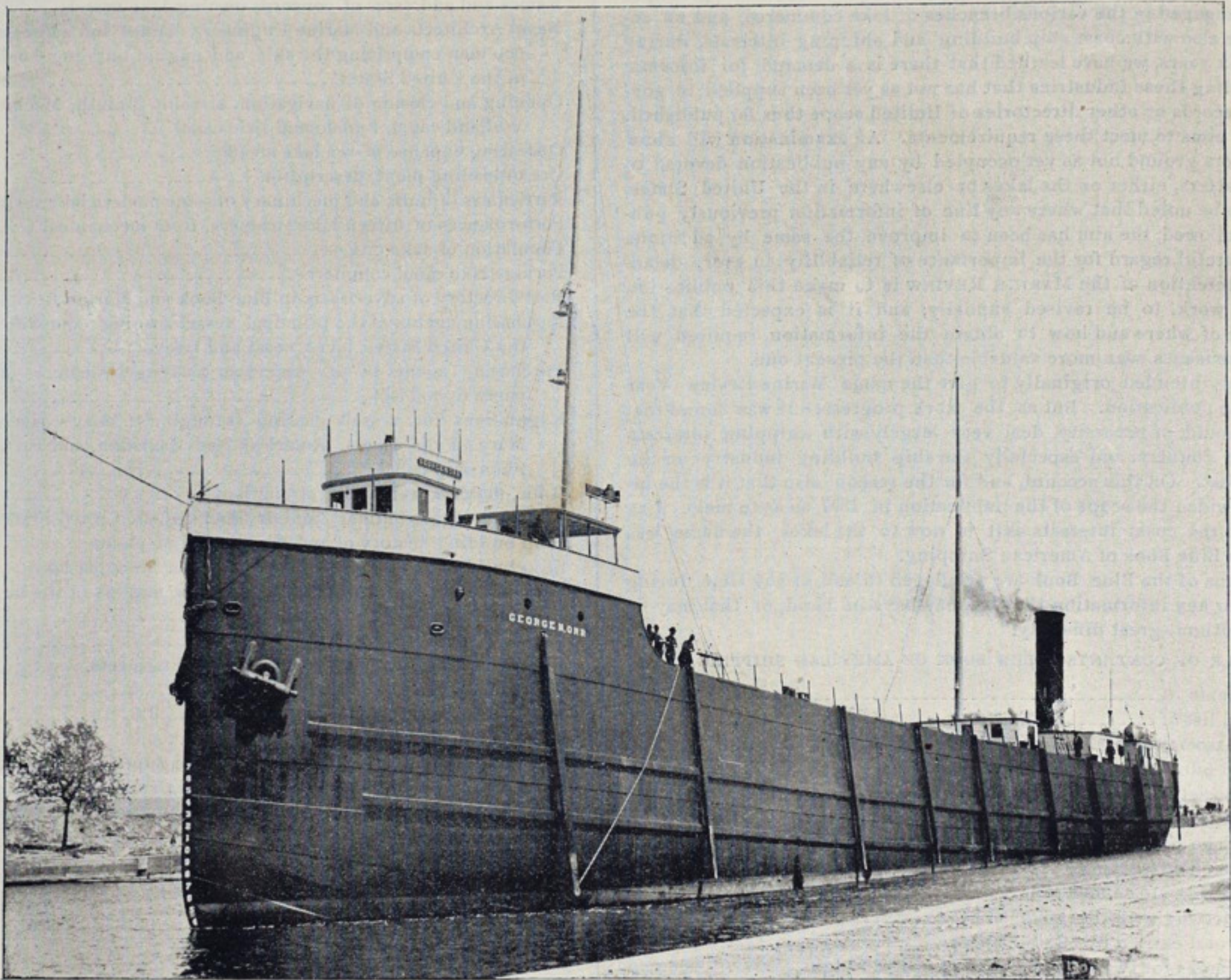
ENGINES: 24, 39, 63 by 42 in.
BOILERS: Four 11-ft. 9 in. by 10 ft.

Steel Steamer Geo. N. Orr.

A picture of the steel steamer George N. Orr, recently built by the Chicago Ship Building Co. for the C. W. Elphicke and others of Chicago, appears on this page. The photograph was taken while the steamer was passing through St. Mary's Falls canal. The Orr is a gangway steamer with a main deck and is specially fitted for rapid handling of package freight. She has four gangways on each side. The hull dimensions are: Length of keel, 326 feet; length over all, 342 feet; beam, moulded, 42 feet; depth, moulded, 26 $\frac{1}{4}$ feet; depth of water bottom, 4 $\frac{1}{2}$ feet. Engines are of the triple expansion type with cylinders 20, 33 and 54 inches diameter by 40 inches stroke. They were built by the Cleveland Ship Building Co. There are two Scotch boilers, each 12 feet 4 inches diameter by 12 $\frac{1}{2}$ feet long. Boilers were also built by the Cleveland Ship Building Co. The Orr has a Williamson steam steerer and Providence steam windlass and capstan. She also has stockless anchors and an electric lighting plant with two direct-connected 125-light dynamos, built by the Fisher Electrical Mfg. Co. A shaft hoister 15 by 12 inches in this ship is the first engine of any kind built by the Chicago company.

act without surrendering the tug as well as the barge; that is, that the limit of the owners' liability was their combined value, with freight pending at the completion of the voyage.

It is, of course, well known that there is a rule which constitutes a tug and tow one vessel for the purpose of applying rules of navigation and determining the liability of one or the other or both for damage done to others, but to hold for any reason that they are one vessel for a voyage, when each is in command of her own master, would seem to involve consequences tending to disturb the whole domain of marine law if followed to anything like a logical conclusion. It is understood, however, that in the case of the J. P. Donaldson, now under advisement in the supreme court of the United States, these questions will probably receive an authoritative determination. The question before that court involves the relations of steamer or tug and tow (a general average case), and as the square question was submitted to them, it is highly probable that the court will review the whole relation. This is the more likely since the direct question involved has never been submitted to any court of final jurisdiction, and the determination of our supreme court will



STEEL PACKAGE-FREIGHT STEAMER GEO. N. ORR OF CHICAGO.

Notes on Important Admiralty Cases.

In the case of the *Columbia* (73 Fed. Rep., 226) the circuit court of appeals for the ninth circuit announces some law, which, while it may not lie in the mouth of laymen to criticise as law, would seem to be a departure from well recognized rules, only to be justified by most cogent reasons, and these the court fails to give. The proceedings were in limitation of liability on the part of the owners of a barge, which, while in tow of a tug belonging to the same owner, had done damage exceeding her value and pending freight. The district court found that the negligence which caused the injuries and damage complained of was that of the master of the barge; that the towage had ended before "the proximate cause of the accident in question was set in motion," and that the barge alone must make compensation.

The circuit court of appeals held that this was error; that no question of "proximate cause" arose in the case; that in law the tug and barge were one vessel "for the purpose of the voyage in question," and it did not matter in that view whether the negligence causing the damage was of the barge or tug; it was the "negligence of the carrier," and the owners could not claim the protection of the limited liability

receive attention by the courts of all seafaring nations, and if supported by their customary good reasons will "make" or settle the law for the world on the questions involved.

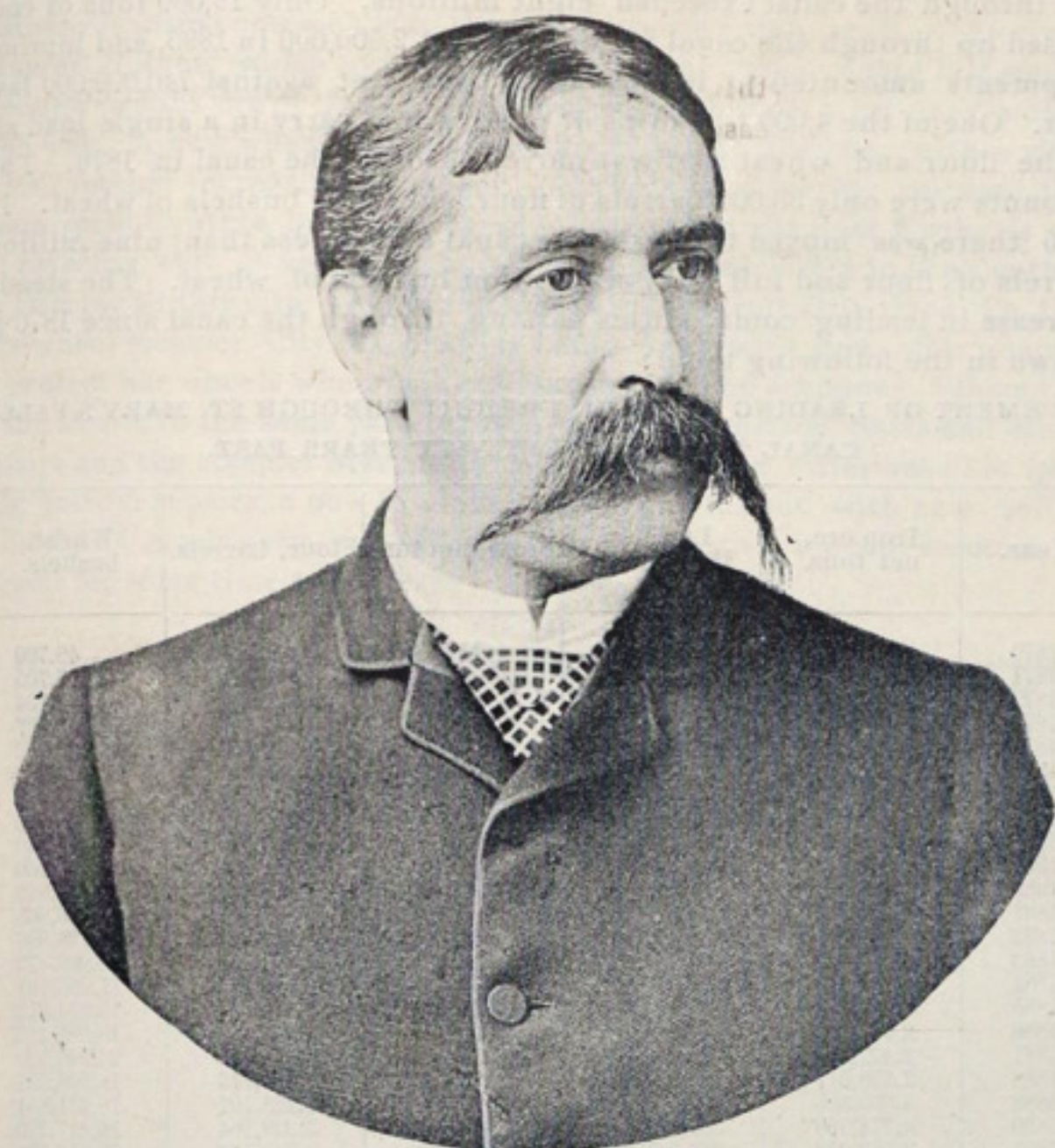
It would certainly seem that the innovation made by the circuit court of appeals in the case of the *Columbia*, which amounts to an extension of the unit of a marine venture so as to embrace more than a single vessel, is not to be commended. If the tug herself had been at fault, a different question might be presented, but the court expressly says that "no question of proximate cause * * * arises in the case." The decision of the supreme court in the case referred to is, therefore, awaited with interest.

The Nickel Plate road sells homeseekers' excursion tickets to the south, June 16, July 17 and 21, Aug. 4 and 18, Sept. 1 and 15, Oct. 6 and 20. For detailed information write any agent of the Nickel Plate road, or address B. F. Horner, general passenger agent, Cleveland, O. 108-30

Low rate, short limit tickets between Cleveland and Lorain have been placed on sale via the Nickel Plate road at \$1.00 for the round trip. 77-7-31

Col. William Ludlow, U. S. A.

Lake vessel owners who remember the controversy between Col. Wm. Ludlow, corps of Engineers, U. S. A., and the United States light-house board, over the lighting of St. Mary's river, may be a little surprised to learn that officer is again in charge of engineering work in one of the most important stations in the service, the third district, New



York. But this duty is by no means the most important that has been assigned to Col. Ludlow by the government since his controversy with the light-house board. As army attache of the American legation in London he conducted an extensive examination of the principal ship-canal of Europe, and was given special recognition and attention by the heads of foreign governments. As the principal member of the commission appointed by President Cleveland to examine and report upon the Nicaragua canal, in accordance with an act of the last congress, he has appeared very prominently in all official inquiry of late regarding that big project. As might be expected, the report of the commission was not favorable to the private interests involved in the canal question, and it will go a long way towards protecting the interests of the government before appropriations are made for the project.

Engines Nearer Amidships.

Although the short reference in a recent issue of the REVIEW to the question of placing engines in large lake steamers nearer amidships was not written with the intention of going into the subject to any great extent, it has attracted considerable attention. Some of the ship builders, who have in the past expressed views decidedly favorable to this change, are slow about taking up the question again, but it is quite certain that the majority of them would favor the change in location of machinery now more than ever, if owners would accept, for the present, the disadvantages in port and endeavor to have dock equipment altered as rapidly as it is possible to do so. Mr. Ricketson, manager of the Inter-Ocean fleet of ore-carriers, sends us the following communication on the subject:

Editor MARINE REVIEW: I am pleased to notice, from articles in your late issues, that the ship building interest is discussing the advisability of placing the engines and boilers of our freight boats on the lakes nearer the center or middle of the boats. In 1890, when the Detroit Dry Dock Co. built the Maryland for our company, I insisted on the machinery being placed near the middle of the boat, although the extra length of shaft and necessary bearing added very considerably to her cost. I have never had occasion to regret it. Up to the present day I have never seen any sign of strain or weakness of any kind, or loose or broken rivets. During the five years she has been in commission she has delivered 636,225 gross tons iron ore and many loads of grain and coal. Her average time unloading 3,000 gross tons of ore at Carnegie dock, Erie, is about seven hours. In 1893 F. W. Wheeler & Co. built the Merida and S. S. Curry and placed their machinery in about the same position as that of the Maryland. I have never heard of any complaint or regrets from owners of the Merida or Curry.

Inter Ocean Transportation Co.,
Milwaukee, Wis., June 8, 1896.

J. C. RICKETSON,
Gen'l Manager,

Heavy Increase in Lake Superior Business.

SHIPMENTS OF GRAIN, COAL AND ORE THUS FAR THIS SEASON SHOW ENORMOUS GAINS OVER THE MOVEMENT TO JUNE 1 IN 1894 AND 1895.

It is certainly remarkable that the shippers of ore, coal and grain on the lakes have crowded a heavy movement of freight into the first two months of the present season of navigation, notwithstanding the depression that is heard of in all other lines of business. This great increase in Lake Superior commerce explains the scarcity of vessels and consequent strong lake freight conditions that have prevailed since the opening. On June 1 of this year more than fourteen million bushels of wheat had been moved from Lake Superior, against less than five millions on the same date in either 1894 or 1895. The movement of soft coal on June 1 amounted to over 400,000 tons, against 44,000 tons in 1895 and 47,000 tons in 1894, and iron ore shipments are 300,000 net tons greater than they were in 1895. It is known also that the ore movement from Escanaba to June 1 is about 100,000 gross tons in excess of what it was on June 1, 1895, so that the total gain in ore shipments from both Lake Michigan and Lake Superior is about 250,000 gross tons. Gains in shipments of principal items of freight to and from Lake Superior are shown in the following table. All 1896 figures have reference to commerce of both Canadian and American canals:

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM LAKE SUPERIOR.

ITEMS.	To June 1, 1896.	To June 1, 1895.	To June 1, 1894.
Coal, anthracite, net tons.....	64,163	48,138	79,531
Coal, bituminous, net tons.....	409,491	44,038	47,424
Iron ore, net tons.....	1,343,284	1,051,129	944,967
Wheat, bushels.....	14,279,954	4,662,390	4,801,490
Flour, barrels.....	1,029,916	1,465,753	1,428,655

The total movement of freight of all kinds to and from Lake Superior to June 1 is 2,746,825 net tons against 1,689,779 net tons on June 1, 1895, or a gain of more than a million tons. The various items making up these totals are shown in the following table:

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE SUPERIOR, FROM OPENING OF NAVIGATION TO JUNE 1 OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

ITEMS.	Designation	To June 1, 1896.	To June 1, 1895.	To June 1, 1894.
Copper.....	Net tons.....	25,085	18,892	17,068
Grain.....	Bushels.....	4,275,098	694,568
Building stone.....	Net tons.....	1,907	2,905	2,563
Flour.....	Barrels.....	1,029,916	1,465,753	1,428,655
Iron ore.....	Net tons.....	1,343,284	1,051,129	944,967
Iron, pig.....	Net tons.....	3,083	6,983	4,045
Lumber.....	M. ft. b. m.....	110,816	87,651	88,846
Silver ore.....	Net tons.....	372
Wheat.....	Bushels.....	14,279,954	4,662,390	4,801,490
Unclassified freight...	Net tons.....	17,110	11,844	22,054
Passengers.....	Number.....	1,053	954	866

WEST BOUND.

ITEMS.	Designation	To June 1, 1896.	To June 1, 1895.	To June 1, 1894.
Coal, anthracite.....	Net tons.....	64,163	48,138	79,531
Coal, bituminous.....	Net tons.....	409,491	44,038	47,424
Flour.....	Barrels.....	62	150	753
Grain.....	Bushels.....	1,109	10,250	500
Manufactured iron...	Net tons.....	14,894	11,128	3,730
Salt.....	Barrels.....	33,812	59,462	21,718
Unclassified freight...	Net tons.....	59,738	45,377	44,189
Passengers.....	Number.....	930	932	834

SUMMARY.

	To June 1, 1896.	To June 1, 1895.
East-bound freight of all kinds, net tons.....	2,188,265	1,531,704
West-bound freight of all kinds, net tons.....	558,560	158,075
	2,746,825	1,689,779

The total number of vessel passages to June 1, 1896, was 3,447 and the registered tonnage 3,340,573.

Death of Stephen B. Grummond.

Stephen B. Grummond of Detroit, who was killed while trying to board a moving trolley car in that city on Friday last, was the second son of the late S. B. Grummond, who was known as a prominent lake vessel owner for a great number of years. For seven years previous to the



death of his father, Stephen B. Grummond, Jr., was engaged as clerk on the Grummond boats, serving on the Flora and Atlantic and later on the State of Michigan. On the death of his father he became manager of the Grummond Mackinac Line and later became sole proprietor of it.

Stocks of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes on June 6, 1896:

	Wheat, bushels.	Corn, bushels.
Chicago.....	14,289,000	5,072,000
Duluth.....	8,508,000
Milwaukee.....	497,000	2,000
Detroit.....	105,000	16,000
Toledo.....	280,000	59,000
Buffalo.....	977,000	170,000
Total.....	24,656,000	5,319,000

As compared with a week ago, the above figures show at the several points named a decrease of 339,000 bushels of wheat and an increase of 373,000 bushels of corn.

Col. Jared A. Smith, United States engineer at Cleveland, has discovered that statistics of lake commerce furnished by collectors of customs are unreliable, and alike to the engineer of the Duluth district, he will endeavor to secure statistics from other sources. He proposes to consult shippers and endeavor to secure the data of which he is in need from them, but he will probably find this an unsatisfactory task. The trouble with customs house statistics on the lakes is their incompleteness, due to defective laws governing the movements of vessels in the coasting trade on the lakes. These statistics are not used by the Lake Carriers' Association. Neither are they used by anybody who understands their defects. The MARINE REVIEW has never used any of them. Changes in the coasting regulations that would bring about reliable statistics are now and have been opposed by vessel owners, who would be put to some little inconvenience in making reports to the government, and this is why the law is not changed.

In a letter to the REVIEW, Capt. A. B. Davis of the revenue cutter Johnson, who has been entrusted with the enforcement of rules governing the navigation of St. Mary's river, says that the rules are being well observed by the majority of vessel masters, but that some do not observe them and are being reported accordingly.

One dollar round trip excursion tickets between Cleveland and Lorain are on sale by agents of the Nickel Plate road.

78 July 31

Lake Superior Commerce.

In compiling statistics for the Blue Book of American Shipping it was found necessary to go into reports of St. Mary's Falls canal traffic for a great number of years past. The growth of Lake Superior commerce, as represented by the canal statistics, is wonderful. It was found, for instance, that in 1870, twenty-six years ago, less than half a million tons of ore came down from Lake Superior, while in 1895 the movement of ore through the canal exceeded eight millions. Only 16,000 tons of coal passed up through the canal in 1870, against 2,500,000 in 1895, and lumber shipments amounted to less than a million feet against 740,000,000 last year. One of the 4,000 ton ships of today would carry in a single load all of the flour and wheat that was moved through the canal in 1870. The amounts were only 33,000 barrels of flour and 49,000 bushels of wheat. In 1895 there was moved through the canal a little less than nine million barrels of flour and full forty-six million bushels of wheat. The steady increase in leading commodities passing through the canal since 1870 is shown in the following table:

MOVEMENT OF LEADING ITEMS OF FREIGHT THROUGH ST. MARY'S FALLS CANAL, DURING TWENTY-SIX YEARS PAST.

Year.	Iron ore, net tons.	Lumber, B. M., feet.	+Coal, net tons	Flour, barrels.	Wheat, bushels.
1870	409,850	722,000	15,952	33,548	49,700
1871	327,461	1,072,000	46,798	26,060	1,376,705
1872	383,105	1,742,000	80,815	136,411	567,134
1873	504,121	1,162,000	96,780	172,692	2,119,997
1874	427,658	638,000	61,123	179,855	1,120,015
1875	493,408	5,391,000	101,260	309,991	1,213,788
1876	609,752	17,761,000	124,734	315,224	1,971,549
1877	568,082	4,143,000	91,575	355,117	1,349,738
1878	555,750	24,119,000	91,856	344,599	1,872,940
1879	540,075	35,598,000	110,704	451,000	2,603,666
1880	677,073	44,539,000	170,501	523,860	2,105,920
1881	748,131	58,877,000	295,647	605,453	3,456,965
1882	987,060	82,783,000	430,184	344,044	3,728,856
1883	791,732	89,131,000	714,444	687,031	5,900,473
1884	1,136,071	122,389,000	706,379	1,248,243	11,985,791
1885	1,235,122	127,984,000	894,991	1,440,093	15,274,213
1886	2,087,809	138,688,000	1,809,999	1,759,365	18,991,485
1887	2,497,713	165,226,000	1,352,987	1,572,735	23,096,520
1888	2,570,517	240,372,000	2,105,041	2,190,725	18,596,351
1889	4,095,855	315,554,000	1,629,197	2,228,707	16,231,854
1890	4,774,768	361,929,000	2,176,925	3,239,104	16,217,370
1891	3,560,213	366,305,000	2,507,532	3,780,143	38,816,570
1892	4,901,132	512,844,000	2,904,266	5,418,135	40,994,780
1893	4,014,556	588,545,000	3,008,120	7,420,674	43,481,652
1894	6,548,876	722,788,000	2,797,184	8,965,773	34,869,483
*1895	8,062,209	740,700,000	2,574,362	8,902,302	46,218,250

+Coal west-bound; all other items east-bound.

*Includes business of Canadian canal, which was about one-half of 1 per cent. of the whole.

Changes in Lights, Buoys, Etc.

The Canadian marine department has issued a printed notice regarding the new buoys on the east side of the 800-foot dredged channel at the mouth of the Detroit river. The axis of this channel is a straight line joining Detroit river (Bar point) light-house and the Canadian light-house on Bois Blanc island. The seven red wooden spar buoys marking this channel have been in place for some time past, and their location is by this time quite well understood by vessel masters.

The United States light-house service has issued a notice regarding another of the 20-foot channel cuts, that at Grosse point. Day marks and lights on the banks of this channel are also by this time well understood by vessel masters, but any captain wishing a copy of the circular explanatory of them can secure it from collectors of customs or from the light-house board, Washington, D. C. The notice is No. 85, season of 1896.

About June 18, a fixed red light of the sixth order will be re-established in the old pierhead light-tower recently removed to a point on the outer end of the extended north pier, about 950 feet to the eastward of Racine light-house, entrance to the harbor of Racine. The focal plane of the light will be 35½ feet above mean lake level. With Racine light (white) the new light will guide clear to the northward of Racine reef, by keeping the white light open to the northward of the new red light. On the same date the fixed red lantern light now shown at a point about 800 feet to the eastward of Racine light will be discontinued. A fog bell will be established at this station on the same date, to be struck by machinery during thick or foggy weather, a single blow every twenty seconds. The bell is suspended from a frame in front of the pier-head tower.

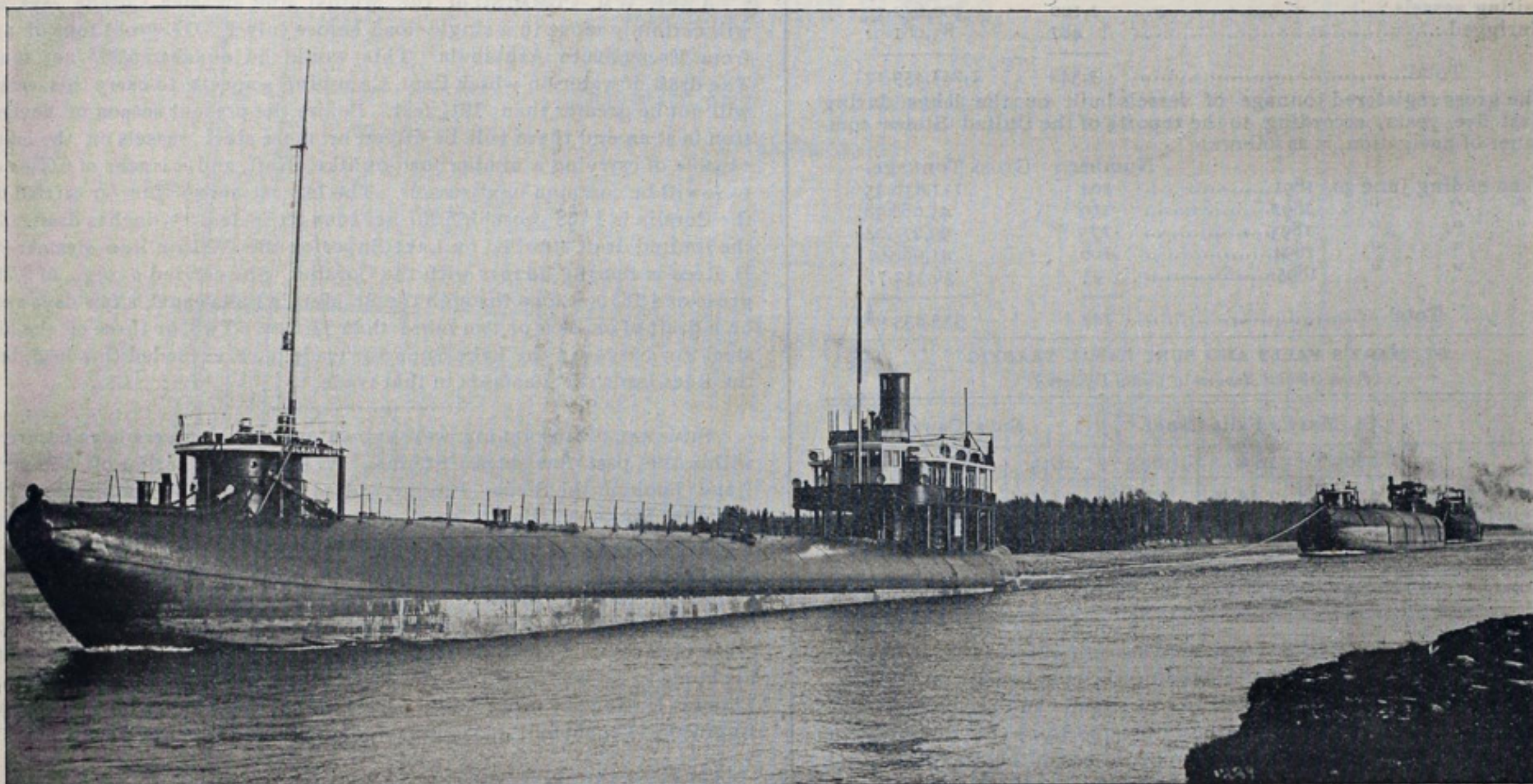
The red second-class nun buoy on the outer shoal, approaches to Port-des-Morts passage, Lake Michigan, has been changed to an automatic bell buoy of the same color.

The important feature of the recent record-breaking trip of the American line steamer St. Paul between Southampton and New York is her average speed for the full distance of 3,113 knots, which was 20.82 knots. The full time from the Needles to Sandy Hook was six days, five hours and thirty-two minutes.

Ship Yard Matters.

A Detroit correspondent says: "The Frontier Iron Works, builders of the Merida engines, will furnish new engines for the boat, and with the aid of S. F. Hodge & Co., to whom they have sublet about half of the work, they propose to have the steamer ready for service again in about sixty days. The wrecked engines have been removed and the Merida is now at an up-river dock awaiting her new machinery. The Frontier company is fitting new webbs to the low pressure crank shaft of the river steamer Unique, which unfortunate craft broke down again last week. The new webbs are of forged steel, instead of the cast steel ones which gave way. A new wheel is also being made for the Unique, with a view of still further increasing her speed. At the Oades marine railway, the steam yacht Cynthia, built last season by the Detroit Boat Works, is up for painting, etc. A new pipe boiler has just been fitted to the Cynthia by Deering of this city. At the works of the Detroit Dry Dock Co. the side-wheel steamer City of Toledo is being fitted with new after guards, to protect her wheels when making landings. The schooner Ashland is at the shears in the same yard for new main and mizzen masts and other repairs and the steamer Marquette is in dock. The latter vessel is getting bottom repairs, a new forefoot, caulking, etc., and with new boiler and rebuilt machinery she will very probably give a good account of herself for some time to come."

at the works of the Union Dry Dock Co., Buffalo, in about ten days is a more substantial vessel than it was thought she would be when the work of constructing her was begun. She is entirely suited to ocean voyages and will rank among the finest yachts as yet constructed on the lakes. The Enquirer is 144 feet long, 17½ feet beam and 10 feet hold. She has a triple expansion Hodge pattern engine, 10½, 17½ and 27 inches by 16 inches stroke. Steam will be generated in a Taylor water tube boiler with 2,200 square feet of heating surface, the grate surface being 50 square feet. The contract is for a speed of eighteen miles an hour, and if the boat does not considerably exceed that speed the builders will be disappointed. The wood work of the yacht is of the best, consisting of mahogany above deck and curly birch inside except that the owner's room, which is finished in bird's-eye maple. The crew's quarters, galley and steward's supply room are all forward and are finished in Georgia pine, left natural color. The guests' cabin will be ample and the berths sufficient to accommodate a large party. The space under the berths is provided with large galvanized iron tanks for storing fresh water for culinary purposes. All quarters below are well lighted by skylights and by a beautiful pattern of brass side lights, which were made especially for the boat. The deck is of Washington pine and the rail is of Georgia pine, with a rope netting and pipe stanchions forming the top-gallant rail. There are two spars, but no sails, and the whole deck is fitted with awnings from end to end. All finishings are of brass. The boat will be steered by a Snelling patent



WHALEBACK STEAMER COLGATE HOYT AND TOW OF TWO BARGES.

(This steamer's barges were ashore during the past week on a sand beach at Chequamegon point, Lake Superior.)

Matters in the ship yard of the Detroit Dry Dock Co. at Wyandotte are being arranged for the launching of the big steel steamer Senator on Saturday, the 13th. The Senator is one of the steamers of the 400-foot type and will be owned by the Wolverine Steamship Co., of which John B. Roby is president and in which Senator McMillan and other stockholders of the dry dock company are interested. The steamer will be managed by Capt. M. W. Humphries. She is 420 feet long over all, 400 feet keel, 45 feet beam and 28 feet deep, and will be propelled by a triple expansion engine with cylinders 22, 35 and 60 inches in diameter by 44 inches stroke. It is expected that on 16 feet draft she will carry about 4,800 gross tons of ore and that with this load her engines, which are of 1,400 horse power, will drive her at the rate of 13 miles an hour. A feature in this boat is a patent anchor in the extreme stern. This is to be used in case of emergency in the "Soo" river and other narrow channels when through current or the influence of a passing vessel control of the big steamer is lost and she begins to swing so as to bring her into dangerous proximity to another boat or to a rock or dock. She will carry one smokestack, two short spars forward of this, will be fitted with Howden hot draft, and will have a complete electric lighting plant, search light, full handling equipment, telephones to connect the master or pilot with distant parts of the ship, etc. Alike to other big coarse freight carriers of her kind, she will have no deck house or in fact anything between the boiler house and texas excepting the deck engines. The Senator will be sailed by Capt. E. B. McQueen, who has been in the Marina, S. S. Curry, Geo. F. McWilliams, John F. Eddy and other steamers.

W. J. Connors' steel steam yacht Enquirer, which will be completed

yacht steerer situated in the pilot house on the deck house forward. The electric lighting plant is suited to operate 400 lights of sixteen candle power. Outwardly the yacht is a steel hull with mahogany upper works, the wood natural color and the metal painted white above and red below water, with a green water line.

The new Wilson line steamer, which is to be built by the Cleveland Ship Building Co. for service in the spring of 1897, is to be 5 feet longer and 3 feet wider than the steamer W. D. Rees, owned by the same line, and which has proven a very large carrier. It is probable also that the new boat will have three boilers. The Rees has but two boilers.

Time for completion of the first-class revenue cutter under way at the ship yard of the Globe Iron Works Co., Cleveland, has been extended from June 30 to Sept. 1. When work was first begun on this steamer there was great delay in securing material.

George B. Raser is the name selected for M. A. Hanna & Co's steam fuel lighter, recently built at Ashtabula. The craft is of 369.54 tons gross and 258.74 net.

A double launch of a pilot boat and a small passenger steamer at the yard of the Newport News (Va.) company a few days ago was marred by the capsizing of the pilot boat, owing to all those on board getting on one side causing the cradle to spread when she gradually filled and went down. Four lives were lost. The pilot boat is 118 feet and the passenger steamer 140 feet in length. The pilot boat was readily raised and was found to be uninjured.



DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, O by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

Entered at Cleveland Post Office as Second-class Mail Matter.

The books of the United States treasury department on June 30, 1895, contained the names of 3,342 vessels, of 1,241,459.14 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1895, was 360 and their aggregate gross tonnage 643,260.40; the number of vessels of this class owned in all other parts of the country on the same date was 309 and their tonnage 652,598.72, so that half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1895, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels.....	1,755	857,735.13
Sailing vessels.....	1,100	300,642.10
Unrigged.....	487	83,081.91
Total.....	3,342	1,241,459.14

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Gross Tonnage.
Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
Total.....	747	335,433.98

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.
(From Official Reports of Canal Officers.)

	St. Mary's Falls Canal.			Suez Canal.		
	1895.*	1894.	1893.	1895.	1894.	1893.
No. vessel pass'ges	17,956	14,491	12,008	3,434	3,352	3,341
T'n'ge, net registd	16,806,781	13,110,366	9,849,754	8,448,246	8,039,175	7,659,068
Days of Navigat'n	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about 1/2 per cent. of the whole, but largely in American vessels.

THE HOUSE committee on commerce has submitted a report favorable to the Nicaragua canal, notwithstanding the conclusions of the commission appointed by the president to investigate and report upon the canal project. The report of the committee questions the reliability of estimates made by the commission on unit prices of the canal work and quotes various statements of engineers to disapprove the findings of the commission. The report says that the questions of the feasibility and permanence of the canal have been definitely settled in the affirmative. Regarding the question of cost the report says that to have charged the railroad system of this country, in its incipency, with the cost of the heavy superstructure and equipment now in use would have been injurious. Whether the depth of canal and harbor shall be 30 feet at the outset, whether four locks shall be used instead of three, whether the water elevation should be 110 feet instead of 106, and other differences between the commission and the company are said to be details depending on whether the policy of making provision for all demands in all time to come is adopted. Owing to the testimony on unit prices the report reduces the estimates of cost on the basis of the commission's plans from \$133,000,000 to \$102,000,000, but holds that \$100,000,000 will be an ample appropriation.

EDITOR WATSON of the Engineer, New York, shows another bilious attack editorially in his last issue. His semi-monthly review of reminiscences for the "old guard" does not require a great deal of hustling, and he has been given the field in this kind of trade journalism all to himself. It is a little strange, therefore, that he should appear wrathful and disappointed because the REVIEW furnished up-to-date information regarding the passage of the engineers' bill and was highly complimented by one of the officers of the national organization of engineers for its enterprise. But even in matters of ancient history it is amusing to see the position in which Mr. Watson sometimes places himself by claiming to know it all. He has questioned some statements made by Mr. Thomas Fitzpatrick regarding the speed of the old Lake Erie steamers Western Metropolis and City of Buffalo. In this connection it is only necessary

to note that Mr. Fitzpatrick erected the engines in the Western Metropolis and was chief engineer of her, while Mr. Watson's knowledge of the vessels was limited to that of an apprentice helping the engineers who erected the City of Buffalo's engines. He also served as greaser on the City of Buffalo for one season.

IT IS PLAINLY evident from a review of lake commerce up to the first of the present month, published elsewhere in this issue, that the disposition among grain, ore and coal shippers, especially the latter, has been to forward a large part of their product early in the season, in order to avoid, as much as possible, great losses on high freights such as prevailed towards the close of last season. More than fourteen million bushels of wheat has been moved from Lake Superior as compared with about four millions on June 1 a year ago. The ore movement from all points in the mining region is about a quarter of a million tons in excess of the shipments at this time a year ago, and more than 400,000 tons of soft coal has gone to Lake Superior, against little more than 40,000 tons on June 1 of either 1895 or 1894. It is not surprising, therefore, that the lake freight market is weak at this time and that conditions indicate a quiet market for June and July. It is the general belief, however, that large ore purchases must be made later on and that the closing months of the season will be the most profitable months for vessel owners, although no boom of the kind that prevailed last year is expected.

CAPT. WM. CUMMING of the Mutual line steamer Coralia says he will certainly move in a single load before July 1, 5,000 gross tons of ore from Escanaba to Ashtabula. This would be equal to 5,600 net tons. The draft of water on which Capt. Cumming expects to carry this cargo will not be greater than 16 1/2 feet. Before the present season of navigation is at an end there will be fifteen or more steel vessels on the lakes capable of carrying a similar load on like draft, and cargoes of 6,000 net tons will be common next season. The largest cargo thus far carried by the Coralia is 4,738 gross or 5,307 net tons on 16 feet 1 1/2 inches draft. In the limited draft afforded on Lake Superior the Wilson line steamer W. D. Rees is sharing honors with the Coralia. She carried a cargo of 3,717 gross or 4,163 net tons through the St. Mary's Falls canal, a few days ago, on a draft of an inch or two more than 14 feet. Two or three of the big steel tow barges in the Lake Superior trade have exceeded this load, but the Rees leads the steamers in that trade.

SEVERAL deaths among well-known marine engineers have occurred within the past few days. Stephen W. Roper, the author of "Roper's Hand Book of the Steam Engine," died suddenly of apoplexy at his home in Roxbury, Mass., aged seventy-three. From New York, the death of John C. De la Vergne is announced. He was the inventor of refrigerating machinery that is in use in some of the largest passenger ships built in this country. Thomas Main, who was with John Roach, the ship builder, for a great number of years, and who designed the engines of several of the best steamers built by Mr. Roach, passed away at his home in Arlington, N. Y., on May 27. On the same day the death of Thomas H. Nelson, one of the past national presidents of the Marine Engineers' Beneficial Association was announced from St. Louis.

THERE is likely to be considerable shifting around of officers of the army engineer corps within the next few months. Changes of stations are expected to grow out of the enactment of the river and harbor bill and the fortifications bill. It is the desire of Gen. Craighill, chief of engineers, to so combine the engineering and fortifications work as to permit of his present force of officers performing the work without much extra labor. For this reason it is probable that he will extend the work of some officers and make several changes of stations. The academic board, it is expected, will be liberal in assigning at least five cadets to the engineer corps, in accordance with an intimation that has gone to Col. Ernst, that no less than this number should be assigned to the corps. There are no vacancies in the corps, and the graduates will have to enter it as additional second lieutenants.—Army and Navy Journal.

DIRECTORS and officers of the Wm. Cramp & Sons Ship and Engine Building Co., Philadelphia, recently elected, are: Directors—Charles H. Cramp, Henry W. Cramp, Thomas Dolan, Clement A. Criscom, Henry Seligman, William H. Barnes, Samuel Dickson, Ernest Thalman and Morton McMichael. Officers—President, Charles H. Cramp; vice-president and treasurer, Henry W. Cramp; secretary and auditor, John Dougherty; assistant secretary and treasurer, Theodore W. Cramp.

TWO NEW CHARTS OF THE ST. MARY'S RIVER, FROM ENTRANCE TO MUD LAKE TO POINT IROQUOIS, INCLUDING HAY LAKE CHANNEL, RECENTLY ISSUED BY THE WAR DEPARTMENT, MAY BE HAD FROM THE MARINE REVIEW AT 35 CENTS EACH.

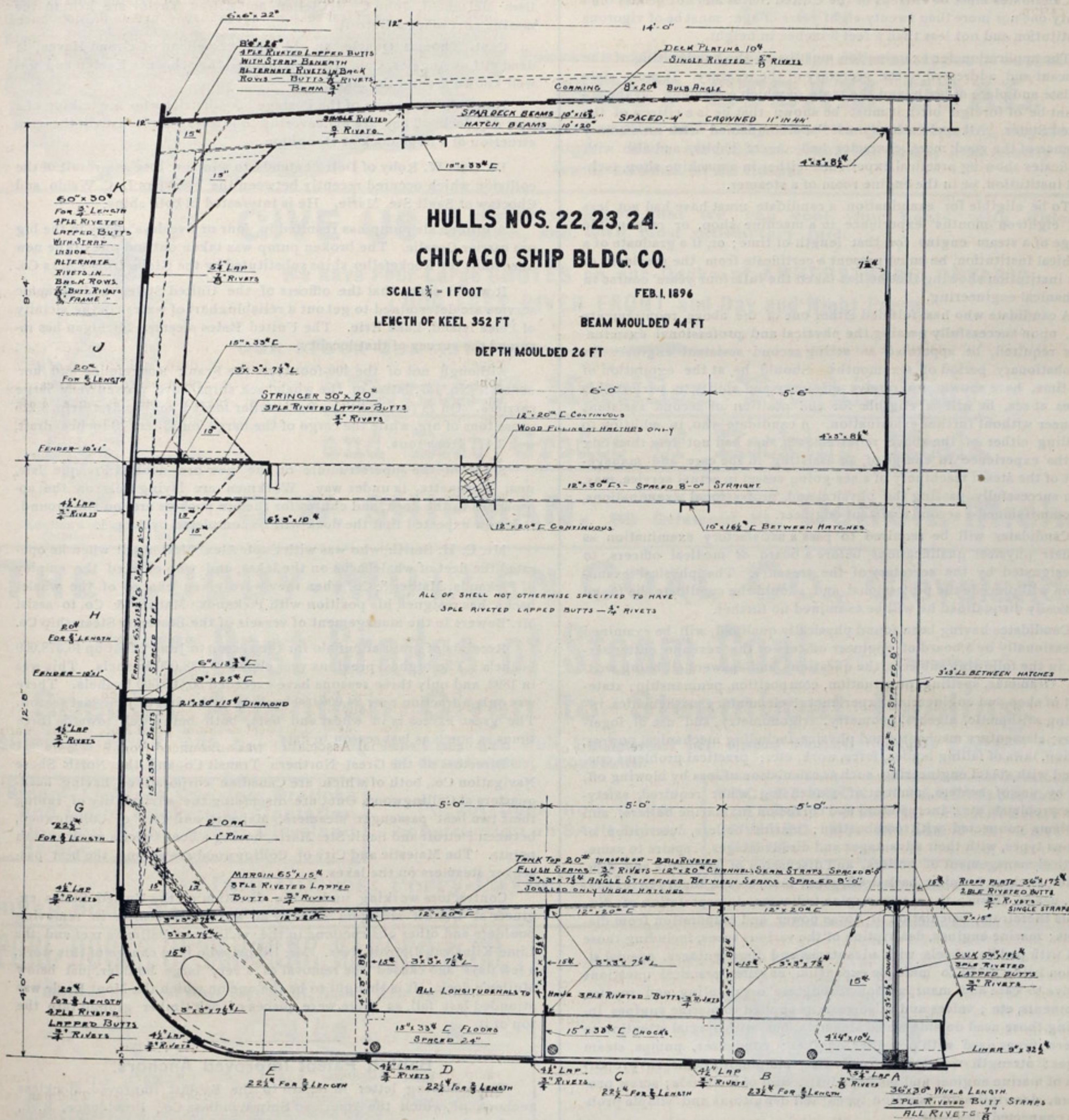
One dollar round trip excursion tickets between Cleveland and Lorain are on sale by agents of the Nickel Plate road. 78 July 31

Rockefeller Ships.

DESCRIPTION OF TWO STEEL TOW BARGES BUILDING AT THE WORKS OF THE CHICAGO SHIP BUILDING CO., SOUTH CHICAGO, ILL.

Three steamers of the Rockefeller fleet have been described in our issues of April 30 and June 4, and there is presented on this page a cross section of the two steel tow barges (duplicates), which are building at the works of the Chicago Ship Building Co., South Chicago, Ill. These vessels will be of the following dimensions: Length of keel, 352 feet;

windlass deck. Aft is a steel deck house, with steel pilot house on top, containing rooms for captain, mate, engineer and steward. The dining room and galley are to be on the main deck aft; also the boiler room, steering engine, ballast pump and an electric plant of 150 lights capacity. These vessels will have three spars and four sails. There is to be on each vessel a Providence steam windlass and capstan forward and Providence steam capstans aft and amidship; a donkey boiler built by the Lake Erie Boiler Works of Buffalo and a Williamson steam steerer, with auxiliary steam wheel forward for use in ports and rivers. The electric plants



MIDSHIP SECTION OF TWO STEEL BARGES BUILDING AT SOUTH CHICAGO FOR MR. JOHN D. ROCKEFELLER.

length over all, 368½ feet; breadth of beam, moulded, 44 feet; depth, moulded, 26 feet; depth of water bottom, 4½ feet. There are two water tight and two cargo bulkheads. The vessels are built on the channel system, and they are of the Basic open hearth steel throughout. The forecastle deck forward is raised to the level of the main rail, with windlass deck below, in the manner first followed by the Chicago Ship Building Co. The towing machine forward is in a half house projecting through the forecastle deck. Deckhands' and dunnage rooms are all on the

are to be put in by the builders, using the General Electric Co's direct connected generating sets.

Extensive alterations and additions are being made to the plant of the Glen Falls Paper Co., and on all new buildings roofs are to be supported by steel trusses, to be furnished by the Berlin Iron Bridge Co. of East Berlin, Conn. New buildings include a machine room 67 by 217 feet; a machine room 52 by 167 feet; a finishing room 50 by 100 feet, and two boiler houses of somewhat smaller dimensions.

Engineers in the Revenue Cutter Service.

Now that the revenue cutter service is about to come into possession of several first-class steamers, both on the lakes and the coasts, it has been found necessary to issue, in circular form, the rules governing the appointment of second assistant engineers. No person will be originally appointed to a higher grade than that of second assistant. Applicants may obtain the necessary blank forms, notice of time of examinations, etc., by addressing the secretary of the treasury at Washington. The rules are as follows:

Candidates must be citizens of the United States and not be less than twenty-one nor more than twenty-eight years of age; must be of vigorous constitution and not less than 5 feet 3 inches in height.

The application for examination must be in the handwriting of the applicant and addressed to the secretary of the treasury. It must state the date and place of birth, and the state of which a resident. If the applicant be of foreign birth it must be shown that he is a citizen of the United States. All applications must be accompanied with satisfactory evidence of the good moral character and correct habits, and also with certificates showing practical experience either in a machine shop, technical institution, or in the engine room of a steamer.

To be eligible for examination, a candidate must have had not less than eighteen months' experience in a machine shop, or responsible charge of a steam engine for that length of time; or, if a graduate of a technical institution, he must present a certificate from the president of such institution showing that he has taken the full four years' course in mechanical engineering.

A candidate who has fulfilled either one of the above requirements may, upon successfully passing the physical and professional examinations required, be appointed an acting second assistant engineer for a probationary period of six months. Should he, at the expiration of that time, have shown progressive efficiency and ability to perform his duties at sea, he will be eligible for the position of second assistant engineer without further examination. A candidate who, in addition to fulfilling either of the above requirements, has had not less than six months' experience in charge of, or assisting in the care and management of the steam machinery of a sea-going vessel in actual service, may, upon successfully passing the physical and professional examinations, be commissioned a second assistant engineer.

Candidates will be required to pass a satisfactory examination as to their physical qualifications before a board of medical officers, to be designated by the secretary of the treasury. The physical examination will precede the professional, and should the candidate be found physically disqualified he will be examined no further.

Candidates having been found physically qualified, will be examined professionally by a board of engineer officers of the revenue cutter service, in the following subjects, the questions and answers all being written: Grammar, spelling, punctuation, composition, penmanship; statement of shop and engineering experiences; elementary mathematics, including arithmetic, algebra, geometry, trigonometry, and use of logarithms; elementary mechanics and physics, including mechanical powers, friction, laws of falling bodies, force, work, etc.; practical problems connected with steam engineering, such as calculation of loss by blowing off, gain by use of heaters, amount of condensing water required, safety-valve problems, etc.; incrustation and corrosion in marine boilers, and problems connected with combustion; marine boilers, description of various types, with their advantages and disadvantages, repairs to same, practical management of boilers, and discussion of accidents and difficulties, such as foaming, back draft, etc.; heat, steam, theory of expansion, use of steam; the steam engine indicator, interpretation of diagrams therefrom, calculation of horse power and evaporation from diagrams; marine engines, description of the various types, including those used with paddle wheels, with advantages and disadvantages, special attention being given to multiple expansion engines, practical questions relative to care and manipulation of engines, overhauling and repairs, alignments, etc.; valves and valve gears as applied to marine engines, including those used on side wheel steamers, but with special attention to modern types used with propeller engines; condenser, pumps, steam gauges; strength of materials, including simple problems in proportions of marine engines and boilers; inspection of materials; screw propellers, description of common types and definitions and simple problems connected therewith.

The professional examination will be competitive, and all candidates who pass the minimum standard required will be placed upon the list eligible for appointment in the order of proficiency exhibited by them, respectively, in the examination. From this list appointments will be made in regular order, as vacancies occur, until another examination is held.

The standard of proficiency has been fixed at 75 per cent., and candidates failing to obtain that average will be rejected. They may, however, if otherwise qualified, take a second examination at the next con-

vening of the board of examiners. Failing in two examinations will result in the final rejection of the candidate.

Any person producing a false certificate of age, time of service, character, or making a false statement to the board of examiners, shall be disqualified for appointment; and any, person who, subsequent to his examination, may become disqualified from moral considerations, will not be appointed.

Around the Lakes.

Letters for E. D. Butler, John Bieth, James Green, C. B. Hatch, William McDonald, John C. McClellan and Alfred Taylor are held in the marine post office at Detroit.

Capt. Thomas Quayle, an old time vesselman of Grand Haven, is dead at Los Angeles, Cal. He commanded the schooner Evelyn and was well known around the lakes.

Now it is the people of the Portage lake district who are talking of a new dry dock. They are endeavoring to interest capitalists in the construction of a large dock at Houghton.

Dr. Geo. W. Roby of Detroit stands to win and lose as a result of the collision which occurred recently between the steamers L. C. Waldo and Choctaw at Sault Ste. Marie. He is interested in both ships.

A broken air pump has resulted in four or five days' delay to the big ore carrier Coralia. The broken pump was taken out and one of the new ones built for Rockefeller ships substituted by the Globe Iron Works Co.

It would seem that the officers of the United States hydrographic service are determined to get out a reliable chart of waters in the vicinity of Pelee island, Lake Erie. The United States steamer Michigan has resumed the survey of that locality.

Although not of the 400-foot type, the Frank Rockefeller and her consort, No. 137, latest of the whaleback ships, have proven very large carriers. On 14 feet draft the Rockefeller loaded on her first trip, 3,225 gross tons of ore, while the cargo of the barge, on 13 feet 10 inches draft, was 3,471 gross tons.

A part of the superstructure on the new ore dock at Presque Isle, near Marquette, is under way. Workmen are laying rails on the approaches to the dock, and chutes for the ore pockets are on the ground. It is now expected that the dock will be completed by Aug. 1.

Mr. E. H. Smith, who was with Capt. Alex. McDougall when he operated the fleet of whalebacks on the lakes, and who entered the employ of Pickands, Mather & Co. when they were given charge of the whalebacks, has resigned his position with Pickands, Mather & Co. to assist Mr. Bowers in the management of vessels of the Bessemer Steamship Co.

Receipts of grain at Buffalo for the season to June 1 foot up 46,378,000 bushels. The highest previous year shows 33,638,000 bushels. This was in 1892, and only three seasons have exceeded 30,000,000 bushels. There was only a fraction over 24,000,000 bushels to the first of June last season. The great excess is in wheat and oats, both being well towards three times as much as last season to date.

Directors of the Great Northern Transit Co. and the North Shore Navigation Co., both of which are Canadian corporations having headquarters at Collingwood, Ont., are discussing the advisability of running their two best passenger steamers, Majestic and City of Collingwood, between Detroit and Sault Ste. Marie, having a boat twice a week at both points. The Majestic and City of Collingwood are among the best passenger steamers on the lakes.

Contractors working under the direction of the United States engineer at Detroit are again steadily at work this season in removing boulders and other obstructions in the vicinity of Ballard's reef and the Lime-Kilns cut, Detroit river. Mr. Dixon, who is in charge of this work, a few days ago caused the removal of a very large boulder, just below Mullen's dock. It is thought to be the one on which the Mont Eagle was stranded last fall, as there were pieces of oak timber ground into the top of it.

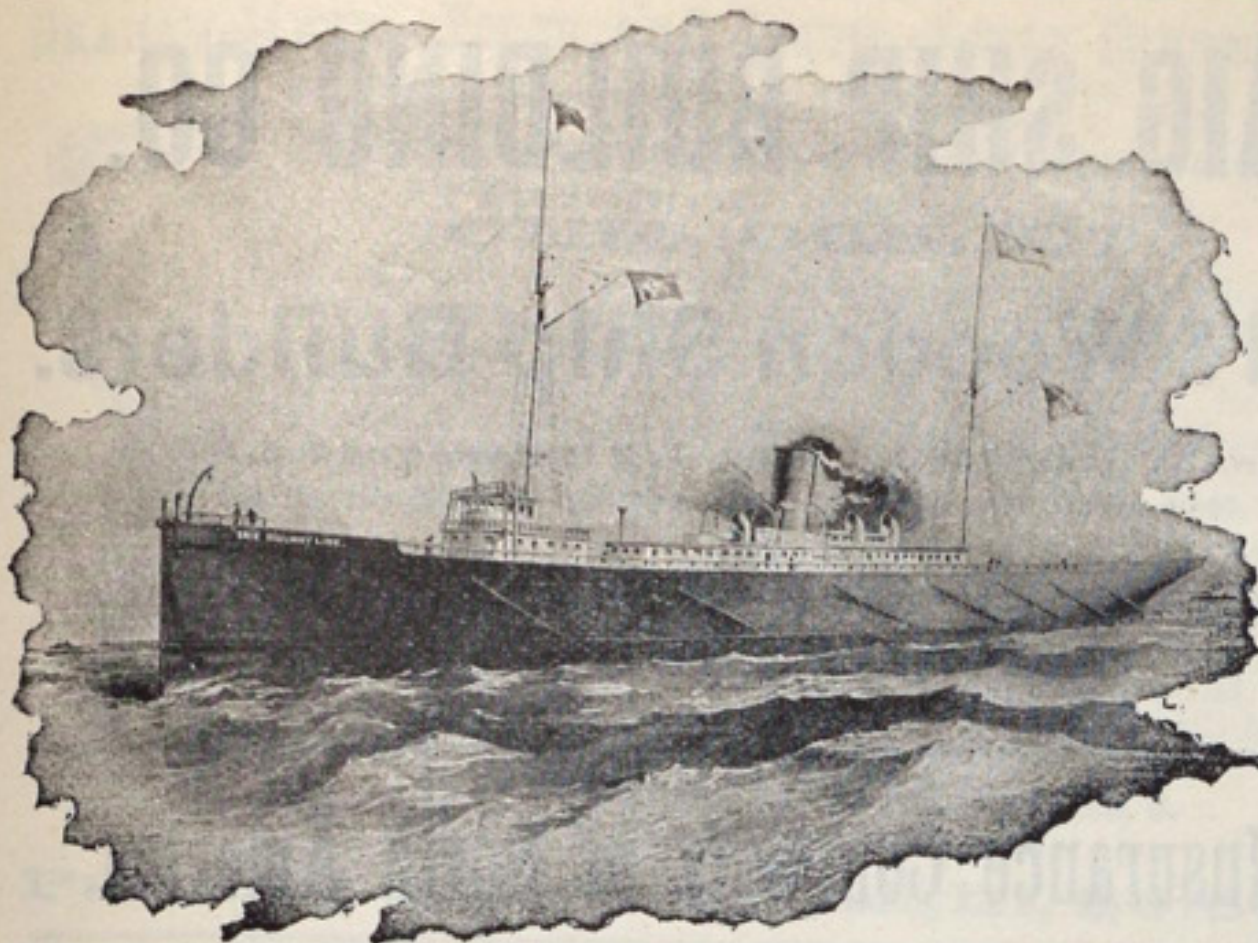
Babbitt Patent Improved Anchors.

The following letter in regard to the Babbitt improved stockless anchors, of which the American Ship Windlass Co., Providence, R. I., are the sole manufacturers, is a very valuable endorsement of the merits of these anchors, particularly coming from so high an authority as Linden W. Bates of Chicago:

American Ship Windlass Co., Providence, R. I.—Dear Sirs: After a thorough trial of your anchors on the dredge Beta on the Mississippi river, I am pleased to testify to their great superiority over any others we used. You will find reports of the dredge in the Engineering News of April 23, 1896. Get it. Send receipt for draft to cover expense of anchors.

Washington, D. C., June 5, 1896.

LINDON W. BATES.



Rapid Fueling Docks, DETROIT RIVER.

JAMES GRAHAM, Foot Twenty-first St., Detroit,
Below Routes of Passenger and Car
Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

BEST STEAM COAL.

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.



Keeping a sharp look-out for
Shipman's Coal Dock.

GIVE US a chance to prove that we can coal your boats with quick dispatch, and with most satisfactory fuel.

We have Four Large CHUTES on our Docks at AMHERSTBURG, ONTARIO,
1,000 FEET RIVER FRONT and Day and Night Force.

OUR STOCK CONSISTS OF

**"Keystone" Massillon, Youghiogeny,
and Best Grades of Hocking Coals.**

O. W. SHIPMAN, MAIN OFFICE,
90 Griswold St., Detroit, Mich.

THE CUDDY-MULLEN COAL CO., Cleveland.

DEALERS
IN

Best Grades of Steam Coal.

Special Attention Given to Steamboat Fueling.

SHIPPING DOCK with Car Dumping Machine and Full Equipment for Rapid Fueling within Eastern Arm of Breakwater, Cleveland.

Steam Lighters Carrying Drericks
and Large Buckets in Operation
Day and Night within Cleveland
Harbor.

Pocket Dock now under
construction on Sault River.

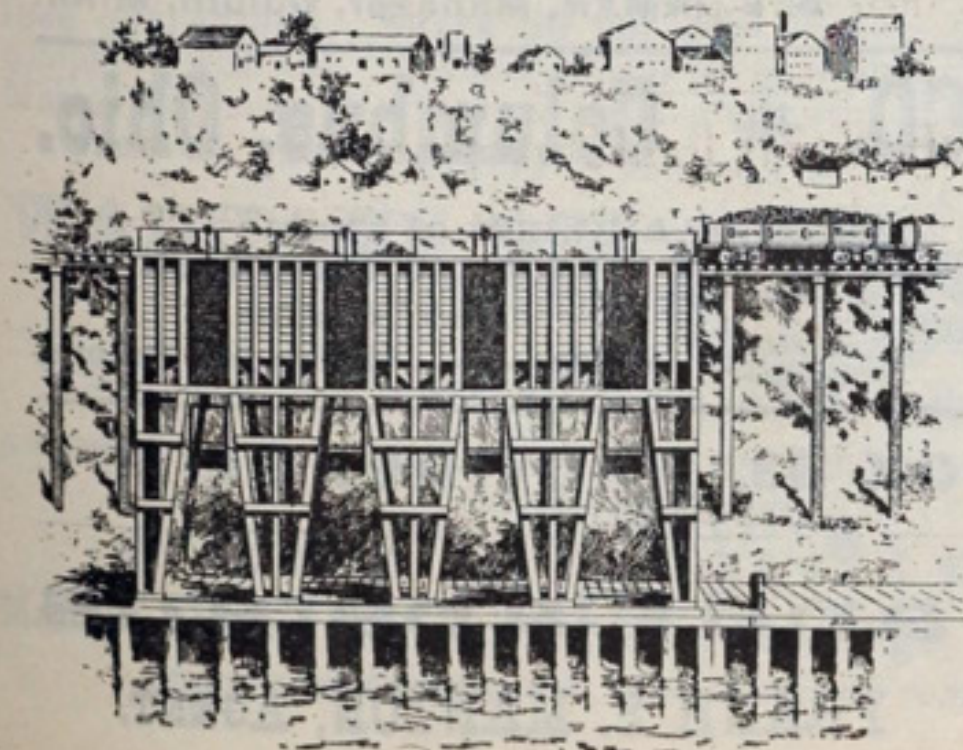
POCKET DOCK AT SANDWICH ON
DETROIT RIVER, FORMERLY
OWNED BY MULLEN & CAT-
FIELD.

Main Offices: Perry-Payne Building, Cleveland, O. Telephone No. 8.

RIVER DOCK, West River Street. Telephone 1441.

FUEL DOCKS OF OSBORNE, SAEGER & CO.

Cuyahoga River, just above Superior St. Viaduct, Cleveland, O.



Best
Youghiogeny
Steam Coal
Furnished
Day or Night.
No delay as
Elevated
Pockets
are used.



COLUMBIA MFG. CO.

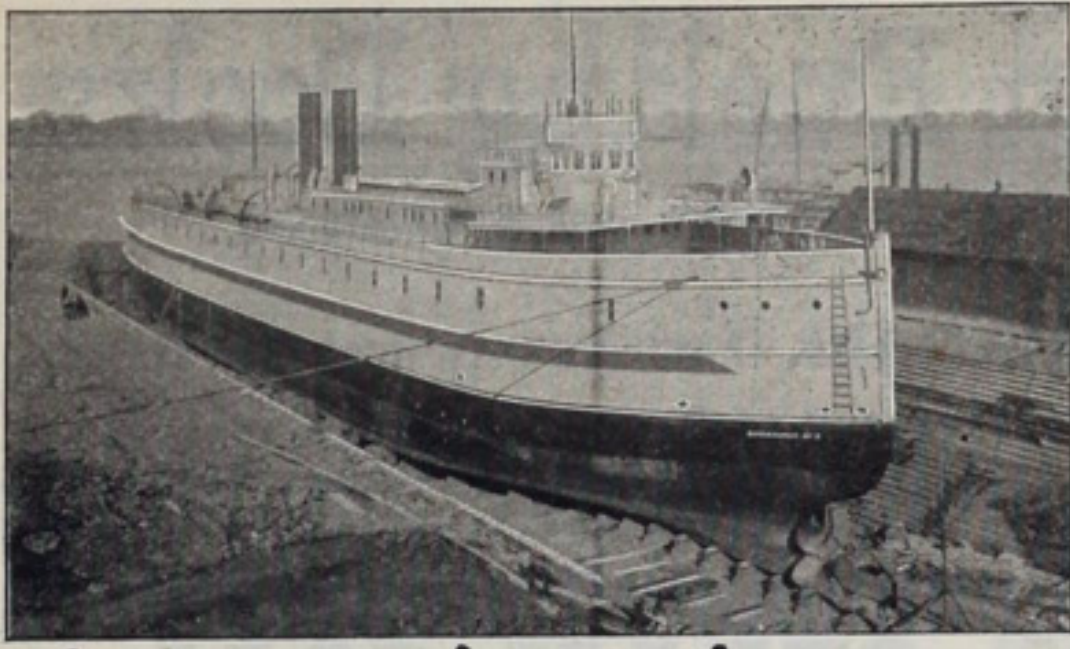
Manufacturers of

METAL POLISH, * BUFFING COMPOSITIONS.

A great labor saver.
Especially adapted for Marine Engines.
1 lb. tin boxes, 45 cents; 5 lb. pails, \$1.50.

94 Holmden Ave., CLEVELAND, O.

John Thompson, 123 River St., Agent, Cleveland, O.



Shenango No. 2, 300 feet long, 54 feet beam.

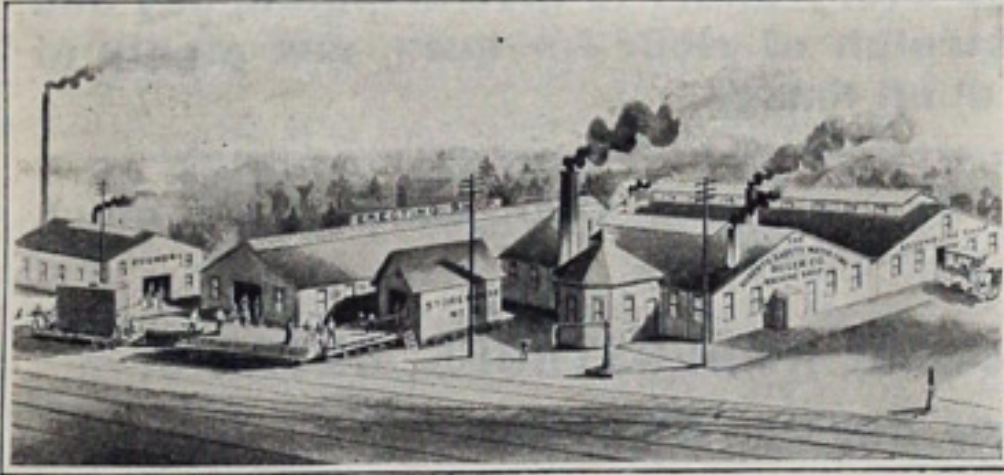
CRAIG SHIP BUILDING CO.

TOLEDO, OHIO,

Metal & Wooden Ship Builders.

New Dry Dock—450 feet long, 110 feet wide on top,
55 feet wide on bottom, 16 feet of Water on Sill.

**Repairs to Metal and Wooden Ships
A Specialty.**



Chicago, Jan. 13,
1896.

THE ROBERTS
BOILER CO.

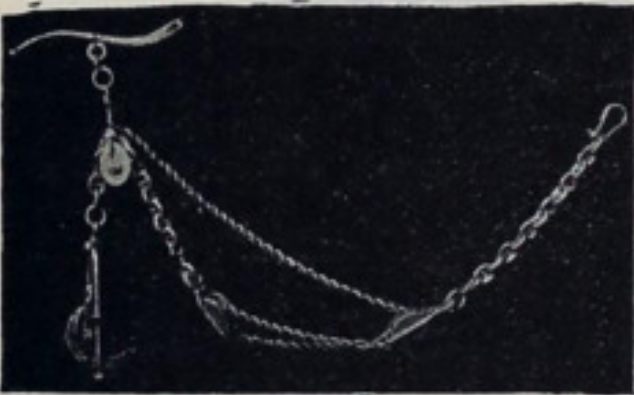
Gentlemen: I cannot see but that the boiler in the "Mamie C" is just as good as it ever was, even if it is 17 years old. I had no complaint from it last summer.

Yours truly,
A. E. CLARK.

THE ROBERTS BOILER is the Cheapest, Best and Lasts Longest
Adapted for use in Yachts, Launches, and Vessels of all Kinds.

Handsome Illustrated Circular sent free on application to

The Roberts Safety Water Tube Boiler Co.,
WORKS, RED BANK, N. J. 39 & 41 Cortlandt St., NEW YORK.

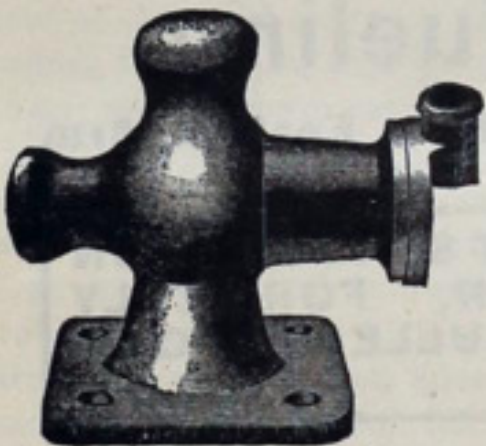


NAUTICAL WATCH CHAIN.

Solid Gold. Ship-shape in every detail.
Send for Descriptive Circular.

MORGAN A. ROBERTSON,
26 John Street, NEW YORK.

Enos Combined Bitt, Winch and Sheet Holder.



Patented in the United States,
England and Canada.

Takes the place of wooden or iron bitts and forms a Combination Bitt and Winch. Takes up less room than the ordinary bitt. Can be used to great advantage as a Windlass or Sheet Holder on Yachts. An examination will convince you of the many uses to which it can be put.

Carried in stock by Ship Chandlers everywhere.

THE ENOS SHEET HOLDER CO.
Manufacturers and Proprietors, PEABODY, MASS.

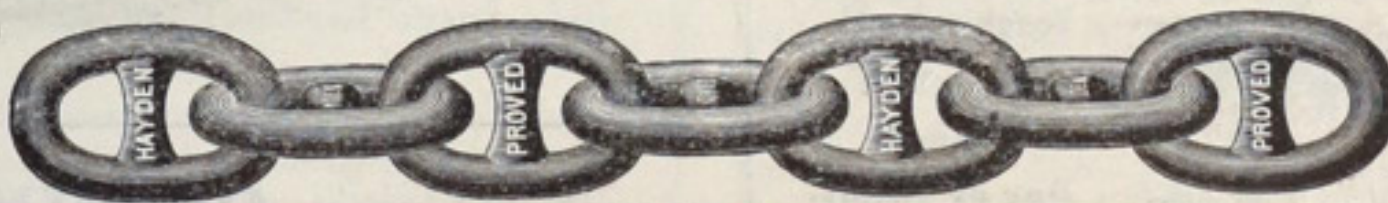
JOHN HAUG, Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London. 206 Walnut Place, Philadelphia.
Plans, Specifications and Superintendence of Ships and their Machinery.
Specialties—Bulk Oil Vessels High Speed Yacht Engines, etc.

Chain Department * P. HAYDEN S. H. CO. * Columbus, Ohio.

Our Chain in use on the Largest Steamers on the Lakes:

The Zenith City, Victory,
North West and North Land,
and many others.



All kinds of Chain—
Stud and Close Link,
Cable Chains.
Write for Prices.

AMERICAN SHIP WINDLASS CO. P. O. BOX 53, PROVIDENCE, R. I.

"Providence" Windlasses and Capstans

350 STYLES AND SIZES.
OVER 5000 IN USE.

SEND FOR CATALOGUE.

FRANK S. MANTON, AGENT.

INCORPORATED 1794.

Insurance Company of North America.

CAPITAL, Paid up in Cash, - - - \$3,000,000.00
ASSETS, - - - - - 9,487,673.53

CHARLES PLATT, President.

EUGENE L. ELLISON, 2nd Vice-President.

JOHN H. ATWOOD, Assistant Secretary.

WILLIAM A. PLATT, Vice-President.

GREVILLE E. FRYER, Sec'y. & Treas.

Lake Marine Department.

GEORGE L. McCURDY, Manager.
CHICAGO, ILLS.

Gas Engine & Power Co.

MORRIS HEIGHTS, NEW YORK CITY.



SOLE MANUFACTURERS OF

The Only Naphtha Launch.

ALSO BUILDERS OF

High Class Steam Yachts and Electric Launches.

Send 10 cent stamp for Catalogue.

For Sale Cheap

particulars address:

Several tugs with engines all the way from 10x12 to 20x20 and all in good repair. For full

INMAN TUG LINE,

B. B. INMAN, Manager, Duluth, Minn.

GRAHAM-MEYER TORCH and LIQUID LIGHT COMPANY

89 Fulton St., Boston, Mass.

MANUFACTURERS OF

**Torches and Liquids for Lights of Various Colors,
For Signal Lights and Illuminations of all kinds.
Blue Flash Lights a Specialty.**

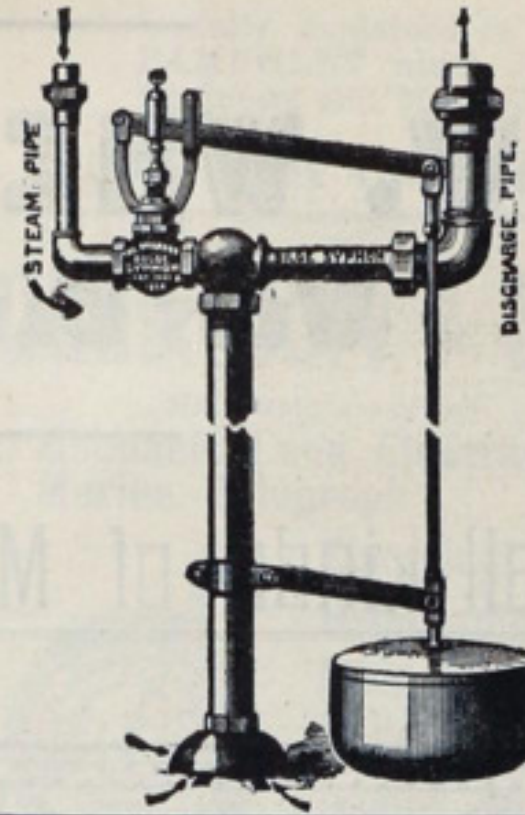


We call the attention of masters of vessels to the efficiency of our patented flare-up or flash light torch. It can be used with kerosene or spirits of turpentine. Its superiority over all other kinds of torches is that it is indestructible. Being filled with asbestos, it will last for years, and is ready for use at any moment. It gives a white flame three to five feet high, burns less liquid than any ordinary torch of the same size or larger. The combustion is so perfect that very little smoke is made, and the flame is therefore much brighter. At night you can wigwag with this torch. Rain or spray will not extinguish it, and the stronger the wind the better it burns. We have also a **Blue, Green and Red Burning Liquid**, to make any code of signals required. Yachtsmen will find this of immense value for signaling.

Lake Agents: { The Upson-Walton Co., Cleveland, O.
H. Channon Co., Chicago, Ill.

Price of Flare-up Light, \$3.50

THE BRAENDER AUTOMATIC BILGE SYPHON,



Always on Watch

"SHIP AHOY."

It never tires, or goes to sleep, and is reliable at all times.

It is the best, cheapest and surest way of keeping your vessel dry.

They are indorsed by leading Engineers throughout the country.

They commend themselves wherever placed. A dry bottom in ship's holds gains speed, which is equal to money.

By giving it a trial, it will speak for itself. Write for circular,

PHILIP BRAENDER,

261 West 118th Street, • NEW YORK.

THE BABCOCK & WILCOX CO. FORGED STEEL WATER-TUBE MARINE BOILER,

29 CORTLANDT ST., NEW YORK.

BOILERS SOLD TO STEAMERS

**NERO,
TURRET CROWN,**

**ALGERIE,
HERO,**

**ELEANOR,
TURRET CAPE,**

**REVERIE,
SENECA,**

**TROPHY,
PRESIDENT,**

**SCOTTISH HERO,
ZENITH CITY.**

Under construction:—For Plant Line Steamship, building by the Newport News Shipbuilding and Dry Dock Co., eight (8) boilers with 20,300 sq. ft. heating surface and 460 sq. ft. grate surface, and pressure 200 lbs. per sq. in.; also boilers for new steamer building by the Cleveland Ship Building Co. for the Zenith Transit Co. (second order) and large tug for Duluth & Iron Range Railroad.

C. S. Richardson Fueling Co.

FUELING DOCKS:
NORTH PIER
18TH STREET BRIDGE,
ILLINOIS CENTRAL SLIP 'C'

STORAGE DOCKS FOR ANTHRACITE:
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.
ELSTON AVE. DIVISION ST. BRIDGE (NORTH BRANCH)
NORTH AVE. BRIDGE.
DIVISION ST. BRIDGE (OGDEN CANAL)
SOUTH HALSTED ST. BRIDGE.

COAL

OFFICE,
225 DEARBORN ST.

CHICAGO.

PRICES REDUCED.

THE O'CONNELL GREASER OR GREASE CUP COMPLETE FOR \$20.00.

In use by many of the largest steamers on the lakes; a **positive feed guaranteed**. Saves 50 per cent in the cost of lubrication compared with Oil. Nothing like it for wristpins and crossheads on Marine Engines. Send for our catalogue testimonials.

MANUFACTURED ONLY BY

**WADHAMS OIL & GREASE CO.
MILWAUKEE, WIS.**

**P. M. CHURCH & CO.,
SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH**

LEADING DEALERS IN

**Ship Chandlery,
Marine Hardware, Paints, Oils, Packings, Cordage, Etc**

FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

THE WILLIAMS & RODGERS CO.

SUPERIOR and SENECA STREETS.

BOAT SUPPLIES

We make special rates to vessel owners on Dry Goods, Bedding, Floor Coverings, Furniture, Kitchen Utensils, etc.

THE WILLIAMS & RODGERS CO., CLEVELAND, O.

The Chase Machine Co.

111 Elm St., Cleveland, O.

**MACHINISTS
and ENGINEERS**

MANUFACTURERS OF
Land and Marine Engines
and Steam Pumps.

SOLE OWNERS AND MANUFACTURERS OF
Chase Fog Whistle Machine.

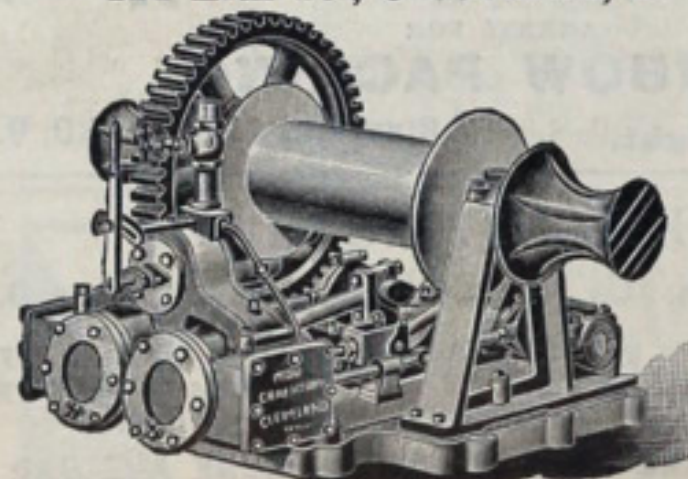
Over 150 in use on the best class
of Lake Steamers.

Special Attention given to

MARINE REPAIR WORK.

Engineers' Supplies,
Asbestos Pipe and Boiler Covering.

TELEPHONE 994.



F. W. WHEELER,
President.

E. T. CARRINGTON,
Vice-President.

C. W. STIVER,
Secy. and Treas.

F. W. WHEELER & CO.,

WEST BAY CITY, MICH.

Builders of all kinds of METAL AND WOODEN SHIPS.

AMERICAN CHAIN CABLE WORKS.

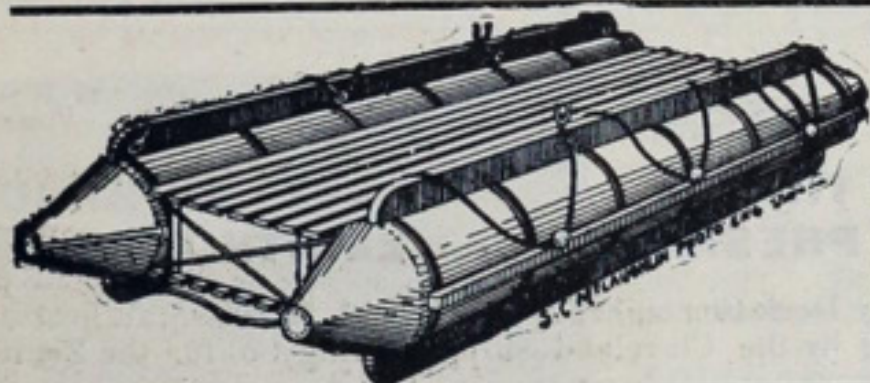
ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

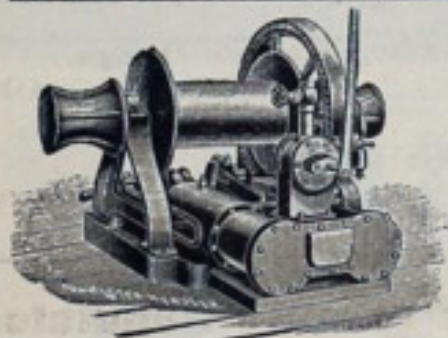
Our Dredge and Crane Chains are made of Iron Rolled Specially for that purpose in three qualities, "Burden's," "H. B. & I." iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.



Thos. Drein & Son,
BUILDERS OF

Metallic Life Boats and Rafts,
Government and Pleasure
Boats. Block and Granulated
Cork Life Preservers. Outfit
for Lake Steamers a Specialty.
TATNALL & RAILROAD STS.
Wilmington, Del.



DOCK and DECK HOISTS
ALL KINDS OF

Machinery & Friction Hoists.

SEND FOR PRICES AND CIRCULARS.

JACKSON & CHURCH,
SAGINAW, MICH.

THE "CINCINNATI"

AUTOMATIC

STEAM STEERING GEAR

A Simple, Powerful Machine. Noiseless and Sure.

SEND FOR CIRCULAR.

FRONTIER IRON WORKS,
DETROIT, MICH.

HOWARD H. BAKER & Co.
Ship Chandlers and Sail Makers,
18 to 26 Terrace. — BUFFALO, N.Y.



H. E. STEVENS. TOM MEAD. LEW PRESLEY

BUCKEYE STEAM FITTING CO.

Steam Fitters, Engineers Supplies,

Phone 4058.

AGENTS FOR

RAINBOW PACKING.

Open Day and Night. 117 River St., CLEVELAND, O.

CAPT. SAMUEL W. GOULD,

Ex-Ass't Inspector of Steam Vessels,

265 Marcy Ave., Cleveland, O.

Gives instructions in Navigation and prepares Candidates for the Examinations, for Master and Pilots Licenses, before the Local Steamboat Inspectors.

Also Instructions given in the Safety Valve and other Problems required by Candidates for Engineers License.

TERMS REASONABLE.

TAKE WADE PARK OR PAYNE AVE CAR.

B. B. INMAN, Manager.

H. G. INMAN, Sec'y and Treas.

Inman Tug Line.

Office on N. P. Dock, Open Day and Night.

TELEPHONE 146

DULUTH, MINN.

Finest outfit at the head of the lakes for log towing.

TUGS.

M. D. Carrington
E. T. Carrington
J. L. Williams
Bob Anderson
Joe D. Dudley
W. B. Castle

L. L. Lyon
F. H. Stanwood
Buffalo
Record
Effie L.
Edward Fiske

P. B. Campbell
Pathfinder
A. C. Adams
Mystic
Lida

Tugs, Hawseers, Steam Pumps, Lighters and Divers. Furnished on Short Notice. Also owners of Steamer Belle Cross and Schooner Clement and Chicago Board of Trade. Three 12-inch Am. Fire Engine Company's Wrecking Pumps, and one 12-inch Worthington Pump.

H. CHANNON COMPANY

Ship Chandlers and Sail Makers.



AGENTS FOR

RYLANDS BROS.

MANUFACTURERS OF

ENGLISH GALVANIZED STEEL HAWSEERS,

24-26 Market Street, CHICAGO, ILL.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

HIGH GRADES OF KILN DRIED WOODS FOR
CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER
ON SHORT NOTICE.

654 Seneca Street,

Cleveland, Ohio.

DETROIT SHEET METAL AND BRASS WORKS

No. 64-66-68-70-72
ORLEANS STREET,
DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings, Packing, Oil and
Engineers Supplies.

Contractors for High Class Steam Fitting, Steam Heating,
Plumbing, Copper Work, and all
Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side
Lights, Marine Hardware, Hurricane,
Cabin and Platform Lamps, Trip
Gongs, etc.

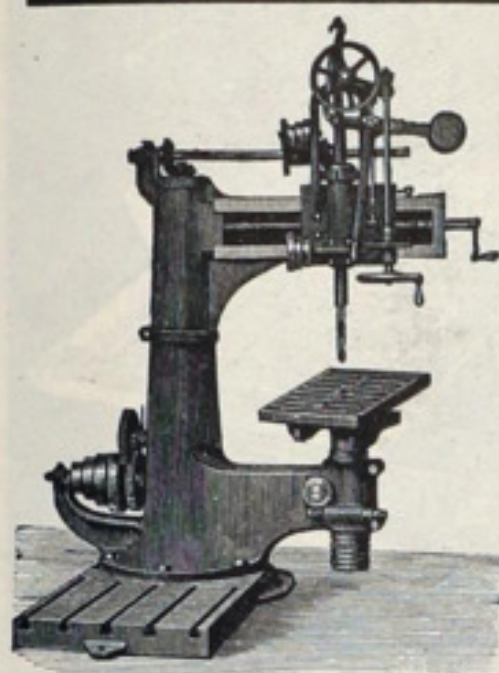
Agents for..... Laidlaw - Dunn - Gordon Steam Pumps,
Warren Webster's Specialties, and
Buffalo Forge Co.'s Fans, Engines and
Heaters.

Engineers can be waited on promptly day or night.

DIXON'S Graphite Pipe Joint Compound

Enables you to MAKE A TIGHTER JOINT than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.



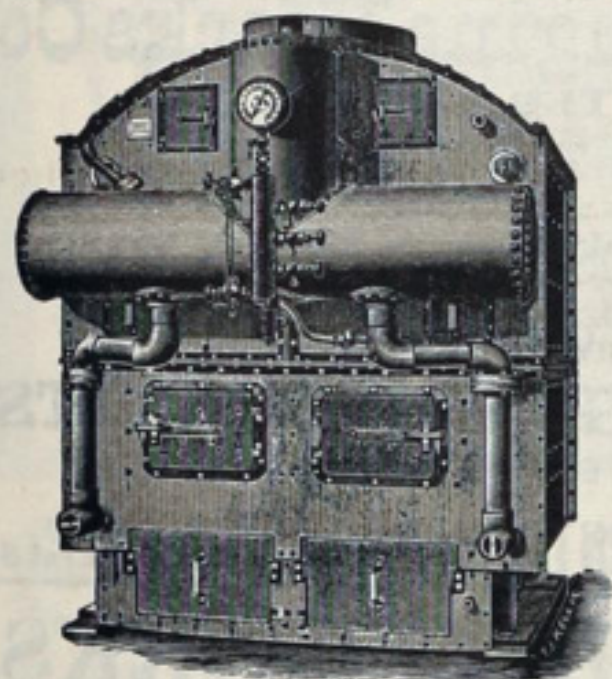
Bement, Miles & Company,
PHILADELPHIA, PA.

MANUFACTURERS OF
Metal Working Machine Tools

For Ship Yards, Railroad Shops,
Locomotive and Car Builders,
Machine Shops, Rolling Mills,
Steam Forges, Boiler Shops,
Bridge Works, etc., etc.

**Steam Hammers, Steam and
Hydraulic Riveting Machines.**

New York Office: Taylor Bldg. No. 39 Cortlandt St.
Chicago Office: 1534 Marquette Building.



**ALMY'S PATENT
SECTIONAL
Water-Tube Boilers.**

NOW USED IN

18 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."
Numerous Small Launches and Stationary
Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,

No. 178-184 Allens Avenue,
near Rhodes St.
PROVIDENCE, R. I.

1880.

1896.

CHAS. H. POTTER & CO.,
Investment Bankers,
Cleveland, O.

Dealers in

**Lake Superior Iron Mining Stocks, Municipal, Water
Works and Street Railway Company Bonds.**

We buy and sell for cash all securities listed on the New York, Boston,
Chicago, Philadelphia, Cincinnati and Pittsburg stock exchanges.



TRY OUR
GRAPHITE PAINTS

For VESSELS, STACKS,
DECKS, HULLS, ETC.

They have No Superior. They are Durable.

CLEVELAND IRON ORE PAINT CO.

156 Merwin St., CLEVELAND, O.

Mention Marine Review.

SHERIFFS MANUFACTURING COMPANY,

Manufacturers of

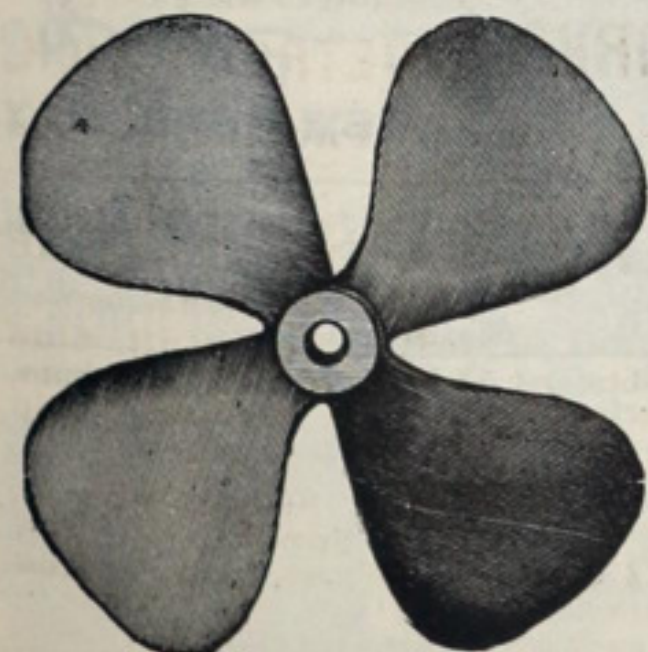
Propeller

Wheels.

**MARINE ENGINES AND
REPAIRS.**

Milwaukee, Wis.

TELEPHONE S.-163.

**DIXON'S Lubricating Graphite**

Is fully explained in an INTERESTING AND INSTRUCTIVE
PAMPHLET which is FREE to all interested. It will pay all
Engineers and Machinists to SEND FOR IT.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Chas. Corv & Son

Manufacturers of the
**Mechanical and Electric
Marine Telegraph,**



**Electrical
Helm Indicators
Electric Call
Bells.**

Engine Bells and
Brass Work of
all descriptions,
Shrieking and
Siren Whistles.

278 DIVISION ST.,
NEW YORK CITY.

Alfred B. Sands & Son



Yacht Plumbers.

MANUFACTURERS OF
YACHT PLUMBING SPECIALTIES.

Pump Water Closets, for above or below
water line.

Folding Lavatories, Ventilators, Pumps,
Deck Plates, Etc.

134 Beekman St., NEW YORK.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors.
Consolidated Cork Life Preservers. Superior to all others. Ring Buoys and Fenders.

SAFEST. CHEAPEST. Approved and adopted by U. S.
Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River
Steamer Lines as the only Reliable Life Preserver. Vessels
and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition



**Metallic
and
Wooden
Life
Boats.**



Metallic Life Rafts, Marine Drags.

Manufacturer of Woolsey's Patent Life Buoy, which is the
lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue.

Get our prices before buying elsewhere.

D. KAHNWEILER,

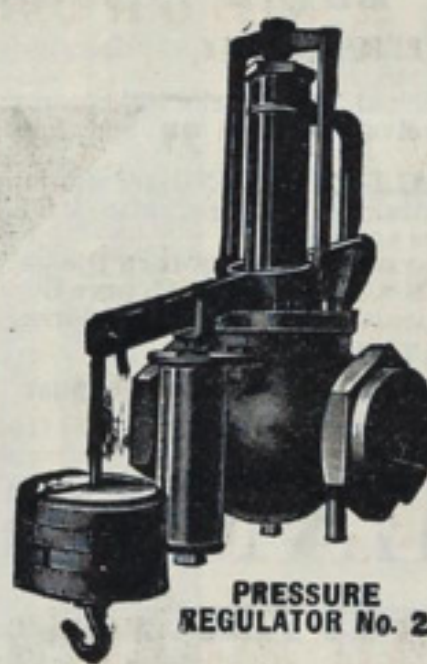
437 Pearl Street, NEW YORK CITY.

The "DAVIS" Pressure Regulator and Reducing Valve.

Is the simplest and best for reducing the pressure to
Steam Steering Engines, Donkey Engines, Steam
Winches and all places requiring a uniform pressure
below that of boilers.

No diaphragms, spring or packing.

Cut shows scale weights. We can furnish lever and
sliding ball weight if preferred.



**PRESSURE
REGULATOR No. 2**

MANUFACTURED BY

G. M. DAVIS & CO.

106 N. Clinton St., CHICAGO, ILL.

FOR SALE BY

R. E. Hills, Chicago. C. H. McCutcheon, Buffalo

Geo. Worthington Co., Cleveland.

P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit

Jas. Clements & Son, Bay City, Mich.

Cleveland Ship Building Co., Cleveland.

Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal
and Brass Works, Detroit, Mich.

OFFICE OF THE LIGHT-HOUSE ENGI-
neer, 7th and 8th Light-house Districts,
New Orleans, La., May 27, 1896. Proposals will
be received at this office until 12 o'clock, noon,
on the 16th day of June, 1896, for furnishing a
new boiler for the light-house tender Arbutus.
Specifications, forms of proposal, and other in-
formation may be obtained on application to
this office. The right is reserved to reject any
or all bids and to waive any defects. JAMES
B. QUINN, Major, Corps of Engineers, U. S. A.,
Light-House Engineer.

Paint your
Vessels with

Superior Graphite Paint.

NO BLISTERING, CRACKING OR SCALING.

Made especially for Stacks, Decks, Sides, Hulls and Water Com-
partments. Strictly anti-rust, and most durable
and economical.

DETROIT GRAPHITE MFG. CO., 541 River St., Detroit, Mich.



McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

SOLE MAKERS OF THE

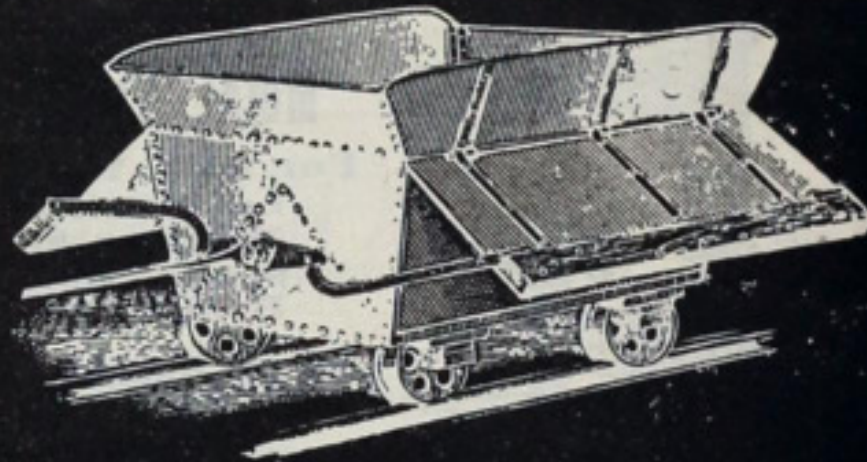
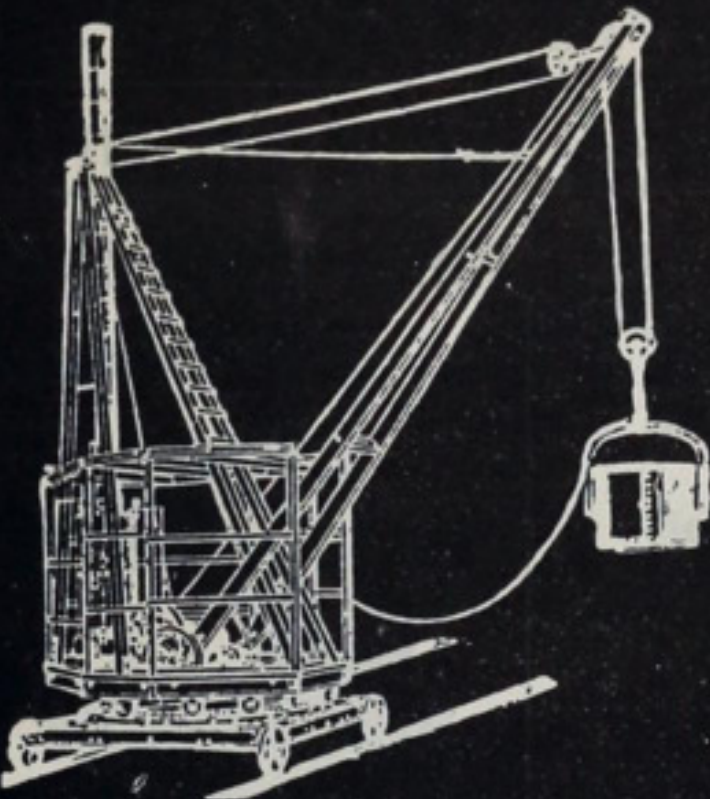
McMYLER PATENT REVOLVING STEAM DERRICK

FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED

BUILDERS OF
CONVEYORS, COAL BUCKETS, ORE
BUCKETS AND DUMP CARS.



"IMPROVEMENT THE ORDER OF THE AGE."

IF YOU DESIRE TO LEARN

Respecting the merits of the THREE NEW MODELS, Nos. 2, 3 and 4, SMITH PREMIER TYPEWRITERS, drop us a line. They embody the Most Progressive Mechanical Principles, and are "up-to-date" in every respect.

The Smith-Premier Typewriter Co.

348 Superior Street, City Hall Building, CLEVELAND, OHIO.
Competent Operators Furnished. TELEPHONE 339.

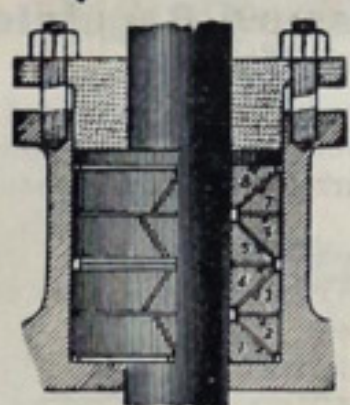
1896—Marine Review Year Book—1896

To be published in May, 1896.

THE most complete and handsomest Marine Directory ever published. Containing new features that will make it necessary to every lake marine business concern of importance. You cannot afford to miss being represented in its advertising columns. Write for prices of space.

Marine Review, 516 Perry-Payne Bldg., Cleveland, O.

KATZENSTEIN'S Self-Acting METAL PACKING,



For PISTON RODS, VALVE STEMS, etc., of every description, for Steam Engines, Pumps, etc., etc.

Adopted and in use by the principal Iron Works and Steamship Companies, within the last twelve years, in this and foreign countries.

FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints on Steam Pipes, and for Hydraulic Pressure; also METAL GASKETS for all kinds of flanges and joints.

DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for Steamers. Also Agents for the McColl-Cumming PATENT LIQUID RUDDER BRAKE. For full particulars and reference, address:

L. KATZENSTEIN & CO.,

General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.

SHIP LAMPS.

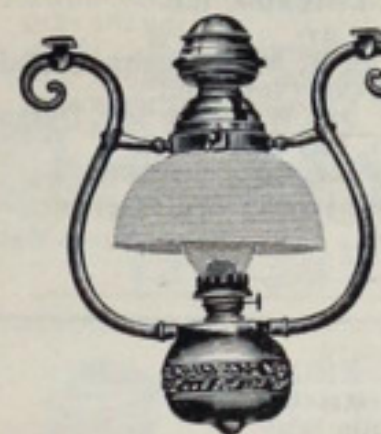
OIL AND ELECTRIC FIXTURES

FOR

Steamships, Yachts, &c.

GREAT VARIETY OF DESIGNS.

Prices and Cuts on Application.



PAGE BROS. & CO.,

347 to 357 Cambridge St. Boston, Mass.



'96 JENKINS '96

Is the Perfection of Joint Packing, Instantaneous, Does not Squeeze out and not necessary to follow up joint. We guarantee it to last for years on any and all pressures of steam or any kind of joint where packing is required. Does not rot, burn or blow out, therefore the best for all purposes. Call for and insist on having '96 JENKINS '96 stamped like cut.

JENKINS BROS. New York, Boston, Philadelphia, Chicago.

The Bertram Engine Works Co. (LIMITED.)

ENGINEERS AND SHIP BUILDERS.

MARINE ENGINES AND BOILERS.

STEEL AND COMPOSITE

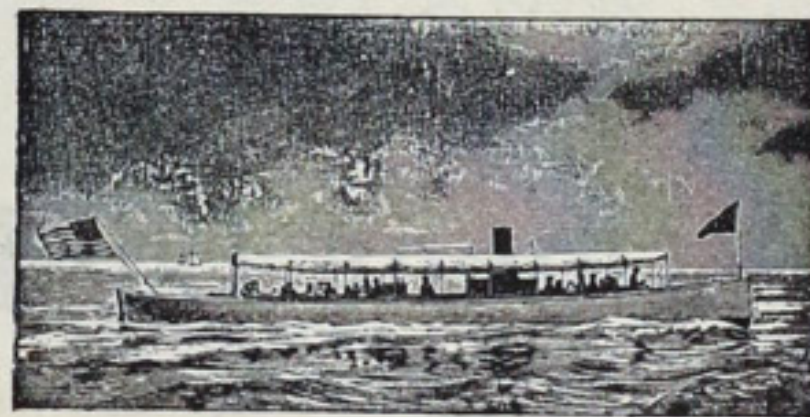
STEAMERS, TUGS and YACHTS.

ROBERTS AND MOSHER SAFETY WATER-TUBE BOILERS.

Office and Works: Niagara & Bathurst Sts., TORONTO, ONT., Ship Yard: Foot of Bathurst St.

DETROIT BOAT WORKS.

STEEL
and
WOODEN



YACHTS
and
LAUNCHES.

BUILDERS OF
ELECTRIC LAUNCHES, DETROIT, MICH.

Any Class Wooden, Iron or Steel Boats up to 150 ft. in length.

YAWLS. METALLIC LIFE BOATS. LIFE RAFTS.

All kinds of Small Pleasure Boats.

The electric launches used on the lagoons at World's Fair were manufactured by this company.

Send for new illustrated Catalogue of electric launches.

For special prices on DEADLIGHTS, write



NEW YORK, N. Y.

MIERS CORVELL

Consulting Mechanical Engineer.

21 E 21st Street, NEW YORK.

Plans, Specifications and Superintendence. Marine and Water Works Engines and Boilers.

JEFFERY'S

MARINE

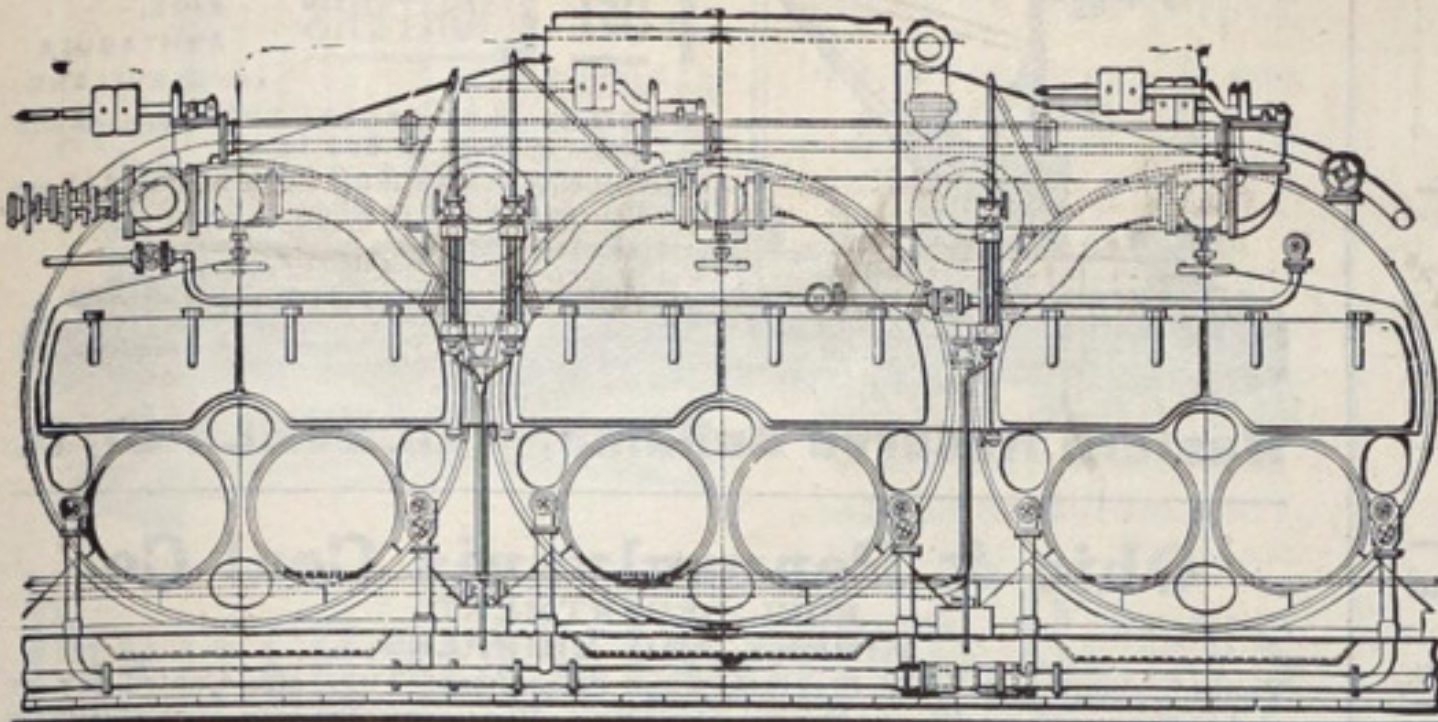
GLUE

Can be obtained from the following well-known firms:

L. W. Ferdinand & Co.	Boston, Mass.
Howard H. Baker & Co.	Buffalo, N. Y.
Geo. B. Carpenter & Co.	Chicago, Ill.
H. D. Edwards & Co.	Detroit, Mich.
Upson-Walton Co.	Cleveland, Ohio.
M. I. Wilcox Cordage & Supply Co.	Toledo, Ohio.

Send for Samples and Circulars.

LAKE ERIE BOILER WORKS, BUFFALO, N. Y.



THE BEST EQUIPPED PLANT
IN AMERICA

FOR THE MANUFACTURE OF
MODERN MARINE BOILERS.



Nickel Plate Ahoy? Aye, Aye Sir!
The line to hail and the line to take
To reach your craft to fit her out,
Is the well-known, ship-hape Nickel Plate Route,
Chicago, Cleveland, Buffalo,
Or any port you want to go,
The shortest time and lowest rate
Are shipmates with the Nickel Plate.

A SUPERB DINING CAR SERVICE.

For particulars inquire of

A. W. JOHNSTON,
Genl. Supt.

or, B. F. HORNER,
Genl. Pass. Agt.

CLEVELAND, O.

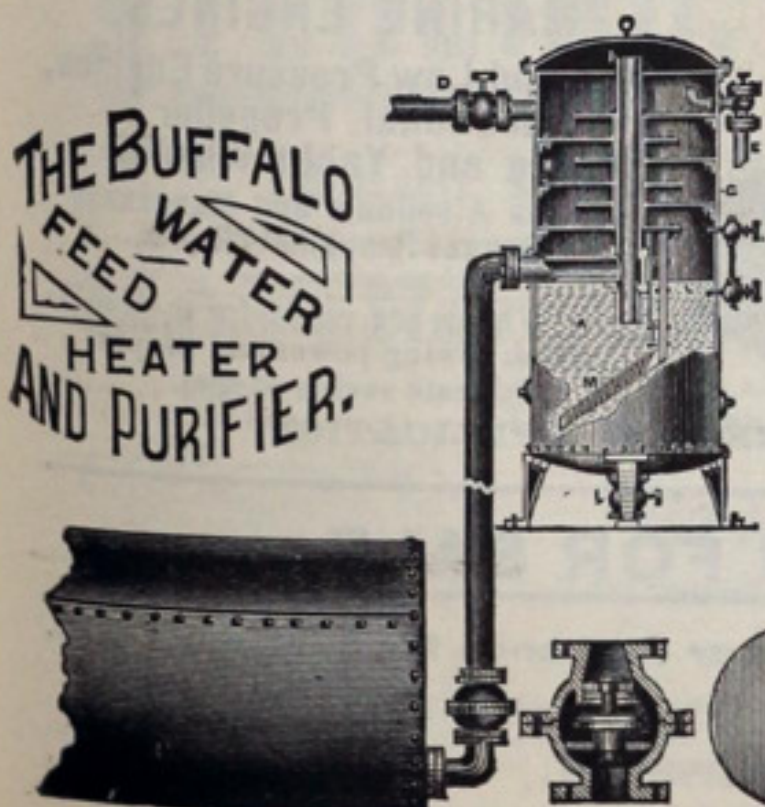
"The most perfect feed water heater and purifier we ever saw."—R. HAMMOND.

IN PRACTICAL USE ON 25 LAKE STEAMERS.

Every Purifier Warranted to Remove all Sediment or
Scale-Forming Substance.

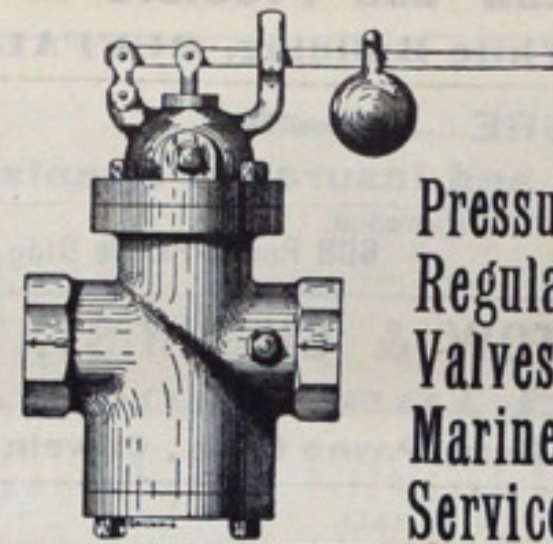
ROBERT LEARMONTH PATENTEE,

200 BOUCK AVENUE, - - - - - BUFFALO, N. Y.



REFERENCES.

- A.—Settling chamber.
- B.—Boiler.
- C.—Feed pipe to boiler.
- D.—Steam pipe.
- E.—Water supply pipe.
- F.—Check valve.
- G.—Spray disks.
- H.—Spray chamber.
- I.—Equalizing tube.
- J.—Blow-off pipe.
- K.—Automatic shut-off valve.
- L.—Division plate.
- M.—Deflector and separator.



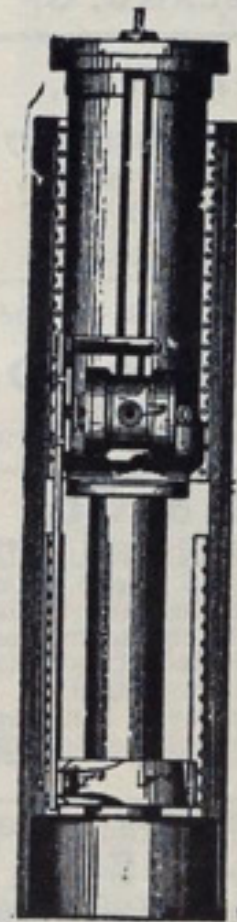
Pressure
Regulating
Valves for
Marine
Service.

Special attention given to
Marine Engine and Pump
Repairs.

Write for Estimates and Catalogue.

C. H. BURTON PUMP WORKS

Main St. cor. Center, CLEVELAND, O.



A. J. DUPUIS,

16 Atwater Street W., DETROIT, MICH.,
CONTRACTOR FOR

Dock Building, Bridge and Trestle Work,

Pile Driving and Foundation Work.

Dry Dock Building; builder of Detroit Dry Dock Co's
New Dry Dock.

PATENTEE AND MANUFACTURER OF

Dupuis Steam Pile Driving Hammer,

Which is very effective, in that it is forced by steam in the down stroke, (which is not the case in other pile drivers), making the ram strike a quick and powerful blow. One advantage of this Hammer over others is, that the steam hose is inside the leaders, and not in the way of hoisting the piles as is the case in other steam hammers.

TWO SIZES of these Hammers are made, one weighing 5000 lbs. and one 7000 lbs. THE WORKING OF HAMMERS GUARANTEED.

U. S. ENGINEER OFFICE, 213 Woodward Ave., Detroit, Mich., May 19, 1896.
Sealed proposals for furnishing all Labor, Materials, and Appliances for (E) widening channel below islands at Little Rapids; (F) widening channel at Angle, foot of Hay Lake; and (G) widening channel from Dike to Angle at Little Mud Lake, will be received here until 2 p. m., June 18, 1896, and then publicly opened. Information furnished on application. G. J. LY-DECKER, Lieut. Col. Eng'rs. May 21-8, Ju 4-11.

FOR SALE

60x10 ft. **STEAM LAUNCH**, 4½ Compound Engine and Condensers, Steam Pumps, etc., Kitchen, Berths, fully equipped, and in first-class order. For particulars inquire Room 65, 94 La Salle Street CHICAGO, ILL.

**..STEAM..
ENGINEERING**
(Loco., Stat'y. and
Marine); Electricity;
Mechanics; Mechanical
and Architectural
Drawing; Plumbing;
Architecture; Mining;
Civil Engineering in
all Branches.
The International
Correspondence Schools



**To Steam..
..Engineers,**
Machinists, Electrical
Workers, Civil Engi-
neers, Draughtsmen,
Steam Fitters, Miners,
Carpenters, Plumbers.
References Everywhere.
Send for Circular.
State Subject you wish
to Study,
Box 965 Scranton, Pa.

HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

ALBERT J. GILCHRIST, PROCTOR IN ADMIRALTY,
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

C. E. KREMER, Attorney and Counselor-at-Law and
Proctor in Admiralty.
Rooms 14, 15 and 16, Bryan Block,
184 LA SALLE ST., CHICAGO, ILL.

BROWN & COOKE,
Counselors at Law and Proctors in Admiralty,
106-107-108 White Building, BUFFALO, N. Y.

HAWGOOD & MOORE W. A. HAWGOOD.
J. W. MOORE.
Vessel and Insurance Agents,
Residence Phone, Doan 446—W. A. Hawgood.
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

J. H. BARTOW.
C. P. GILCHRIST. **BARTOW & GILCHRIST,** TELEPHONE 717.
Vessel and Insurance Agents,
611 and 612 Perry-Payne Bldg., Cleveland, O.

ALEX. CLARK. J. B. HALL. J. H. KILLERAN,
Marine Surveyor.
A. Clark & Co. VESSEL AND INSURANCE AGENTS,
Tel. No. 892. 55 Main St., BUFFALO, N. Y.

JOHN MITCHELL. JOHN F. WEDOW. ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building,
Office Telephone, 787. Residence, John Mitchell, 3506.
CLEVELAND, OHIO

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

H. S. LORD. J. H. NORTON.
LORD & NORTON,
Attorneys-at-Law,
Proctors and Advocates in
Admiralty,
DULUTH, MINN.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

C. F. Palmer. C. L. Hutchinson
PALMER & CO.,
Vessel Agents and Underwriters,
515 Perry-Payne Bldg., Cleveland, Ohio.
Telephone 644.

**The M. I. Wilcox
CORDAGE & SUPPLY CO.**
Steamboat, Vessel and Mill
Supplies.
STEAM YACHT, "MINNIE D."
210-216 Water Street,
TOLEDO, OHIO.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

C. W. ELPHICKE. JAS. A. MYERS.
A. L. FITCH.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS,
Room 10, No. 6 Sherman St., Chicago, Ill.

H. J. WEBB & Co.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co.
will charter vessels for the lake trade.
Special attention given to chartering ves-
sels in the Lake Superior Iron Ore trade,
both for the season and single trip.
No. 606 & 607 Perry-Payne Building,
Cleveland, O. Office Telephone No. 338,
Residence No. 3228.

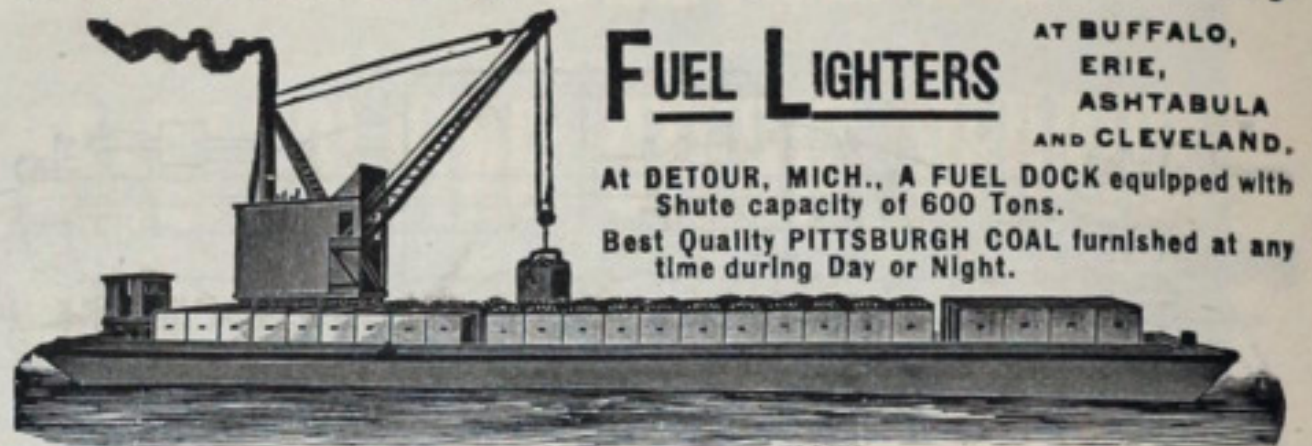
J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers,
and Marine Insurance,
16 Board of Trade,
DULUTH, - - MINN.

VANDUZEN Steam JET PUMPS
THE BEST IN THE WORLD.
Pumps any kind of Liquid. Always in order.
Never clogs nor freezes. Fully Guaranteed.
COST \$7 AND UPWARD. Especially useful for
Mines, Quarries, Pits, Wells, Clay Pits, Breweries,
on Steamships, Ferryboats, Sugar Plantations, etc.
A full stock always on hand.
Descriptive Catalogue and Prices fur-
nished Free. THE E. W. VAN DUZEN CO.,
Cincinnati, O.

PATENTS

Promptly secured. Trade-Marks, Copyrights
and Labels registered. Twenty-five years ex-
perience. We report whether patent can be
secured or not, free of charge. Our fee not due
until patent is allowed. 32 page Book Free.
H. B. WILLSON & CO., Attorneys at Law,
Opp. U. S. Pat. Office. WASHINGTON, D. C.

Pickands, Mather & Co.,



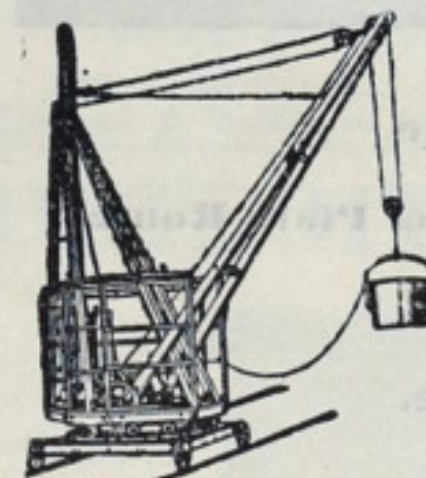
Western Reserve Building, CLEVELAND, O.

Ohio & Pennsylvania Coal Co.

FUEL DEPARTMENT.
MINERS AND SHIPPERS,
Youghiogeny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or
night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT
PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with
Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

THE PITTSBURGH AND CHICAGO GAS COAL CO.
MINERS AND SHIPPERS OF
Pittsburgh and Youghiogeny Coal.

Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge.
Latest equipment for rapid fueling of Steamers at all hours, day or night.
Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.
Telephone { Office 1888.
Fuel Dock 1590.
Ore Dock, 2413. J. A. DONALDSON, Agent,
420-421 Perry-Payne Building.

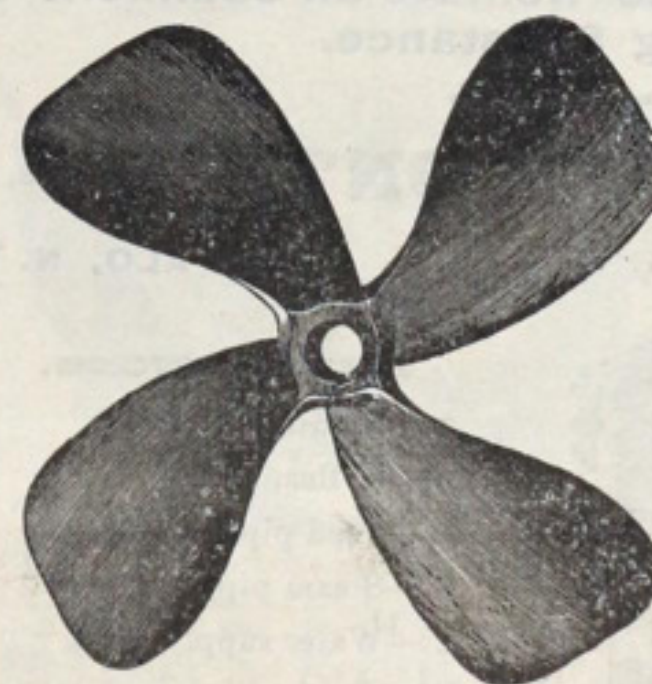


TOLEDO FUEL CO.,

Cambridge, Hocking, Jackson
and Massillon Coal
Wheeled on or put on with DERRICK,
NIGHT OR DAY.
SATISFACTION GUARANTEED.
H. H. WILLIAMS, Manager.
Located on Penn. Dock, TOLEDO O.
GET OUR PRICES. Phone 1441.

H. A. BARR, PRESIDENT, F. H. VAN CLEVE, SMC. CAPT. GEO. BARTLEY, SUPT.
Escanaba, Escanaba, Escanaba.
ESCANABA TOWING & WRECKING CO., Escanaba, Mich.
Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, { Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch-
Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, { Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, { Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.
CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction

**H. G. TROUT,
KING IRON WORKS,**



BUFFALO, N. Y..
MANUFACTURERS OF
**TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,**
High and Low Pressure Engines,
Sectional. Propeller,
Tug and Yacht Wheels,
Cowles Aluminum and Manganese
Bronze Propeller Wheels.

These Wheels are noted for their extra
speed, towing power and propor-
tionate saving of coal.

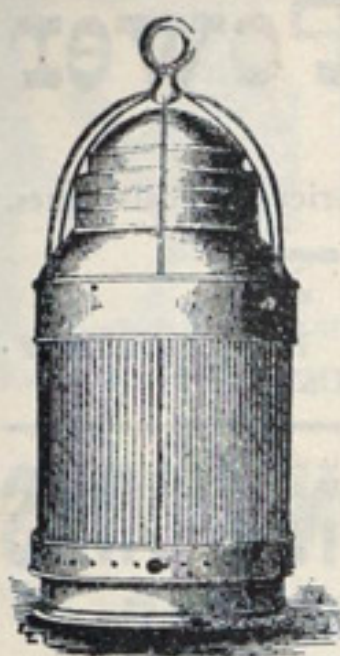
PRICES QUOTED ON APPLICATION.

PRIVATE CAR FOR SALE

or Exchange for a Steam Yacht.

—FOR FULL PARTICULARS, ADDRESS—

E. D. BROWN, - 26 River St., - CHICAGO, ILLS.



Buffalo Signal Lamps,

For Steamers and Sailing Vessels.

Patent Fluted Lens and Perfect Colors

GET THE BEST AND AVOID COLLISIONS.

Manufactured by

RUSSELL & WATSON,

Successors to FELTHOUSEN & RUSSELL,

145 Main St.

BUFFALO, N. Y.

SEND FOR CATALOGUE.

PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian, and United States Light House Departments, for channel and harbor lighting; over 500 gas buoys and gas beacons in service.

BURN CONTINUOUSLY from 80 to 365 days and nights without attention, and can be seen a distance of six miles.

Brilliant and steady illumination.

Economical and reliable in operation.

CONTROLLED BY THE

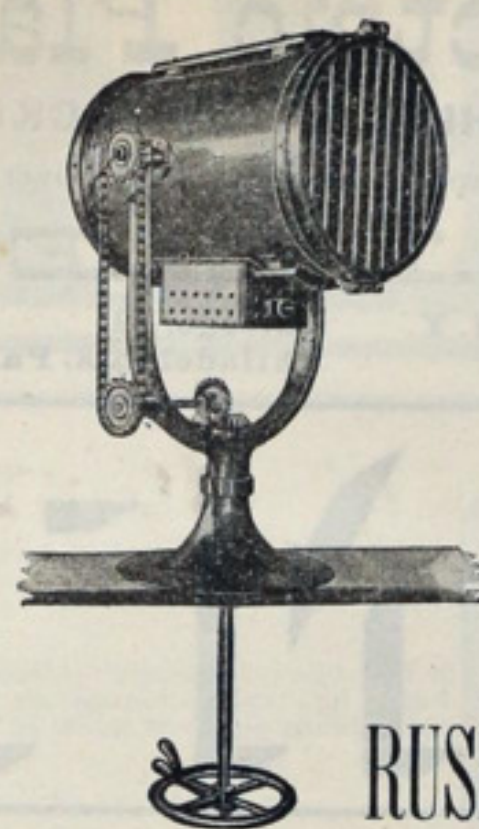
SAFETY CAR HEATING & LIGHTING COMPANY,

160 Broadway, New York City.



ALL NEW HYDROGRAPHIC CHARTS ARE KEPT IN STOCK BY THE MARINE REVIEW, 516 PERRY-PAYNE BUILDING, CLEVELAND.

CAPTAINS AND MATES ARE INVITED TO CALL AT THE OFFICE OF THE MARINE REVIEW AND LOOK OVER THE CHARTS AND SAILING DIRECTIONS OF LAKES SUPERIOR, MICHIGAN, HURON, ERIE AND ONTARIO, PUBLISHED BY THE HYDROGRAPHIC OFFICE.



Type D. Pilot House.

PROJECTORS!

10 MILLION TO

100 MILLION

CANDLE POWER.

The only successful commercial light.

Adopted and endorsed by leading steamship lines and builders.

Have Replaced All Other Makes.

CATALOG NOW READY.

RUSHMORE DYNAMO WORKS,

JERSEY CITY, N. J.

THE Swain Wrecking Co.
E.M. PECK, Pres.

The TUG FAVORITE
STATIONED AT CHEBOYGAN MICH.
WITH COMPLETE WRECKING OUTFIT
IN CHARGE OF
Capt. P. L. Millen
CANADIAN WRECKER SAGINAW
STATIONED AT DETROIT, MICH.
ENABLES US TO WRECK IN CANADIAN
WATERS
STEAM PUMPS AND SUB-MARINE
WORK IN CHARGE OF
JOHN S. QUINN.
Address all communications to
PARKER & MILLEN
OFFICE
15 ATWATER ST. WEST
DETROIT, MICH.

4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.

1 COAL AND ORE PUMP
3-12 INCH ROTARY.
1-14 INCH WORTHINGTON.

DIVING RIGS
AND
DIVERS ABOARD
ALL TIMES

1896		MAY.	
3	4	5	6
10	11	12	13
17	18	19	20
24	25	26	27
31		28	29
		30	

10-100 TON JACKS
1-12 INCH HAWSER
1-10
1-9

Telegraph
Capt. P. L. Millen
CHEBOYGAN, MICH.

**TELEGRAPH
PARKER & MILLEN,
DETROIT, MICH.**

STERLING, WELCH & CO.

12 and 14 Euclid Ave., CLEVELAND, O.

BOAT FURNISHING A SPECIALTY.

CARPETS, OIL CLOTHS,

CURTAINS, &c., &c.

SUPPLIED AT WHOLESALE RATES.

MARINE VALVE OIL FOR INTERNAL LUBRICATION.

Marine Valve,
Renown Engine,

Eldorado Engine,
Crank Case,

Victor Signal,
Dark Lubricating,

Mineral Seal,
Head Light,

Artic Cup Greases,
and Lard Oils.

— CARRIED IN STOCK AT THE —

STANDARD OIL COMPANY'S MARINE DEPOT,

TELEPHONE 77.

123 River Street, CLEVELAND, O.

MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE
BY
**STANDARD OIL
COMPANY,**

Chicago, Ill., No. 5 Wabash Ave.
Racine, Wis.
Milwaukee, Wis., Broadway & Mason.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.

Marinette, Wis.
Oshkosh, Wis.
Duluth, Minn.
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.

Buffalo, N. Y.
Sault Ste. Marie, Mich.
West Bay City, Mich., M.C. Ry. & 10th St.
Saginaw, Mich., Eighth & Sears Sts.
Detroit, Mich., 46 Jefferson.
Toledo, O., Summit & Monroe Sts.

A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY Co., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY Co., Toledo, O.

ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.

EDWARD BRAMMALL, Bnton Harbor, Mich.
BABY & DALE, St. Clair, Mich.
N. C. ALTEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.



Complete Electric Plants for Light and Power

On STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.

Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

GENERAL ELECTRIC COMPANY.

SALES OFFICES: { Schenectady, N. Y. Chicago, Ill. Detroit, Mich. Buffalo, N. Y. Columbus, O. New York, N. Y.
Boston, Mass. Philadelphia, Pa. Baltimore, Md. Portland, Ore. San Francisco, Cal.

FRONTIER IRON WORKS

MARINE ENGINES, DETROIT, MICH.

STEAMBOAT CAPTAINS
ENGINEERS, CREWS,

BUY RAILROAD TICKETS

READING

Flint & Pere Marquette
R. R.

WHEN GOING TO

SAGINAW BAY CITY,
MANISTEE,
LUDINGTON, MILWAUKEE.

SHORT LINE,

CHEAP RATES.

A. PATRIARCHE, Traffic Mgr.
SAGINAW, MICH.



JOHN DODD,

Sub-Marine
Diver.

Headquarters
at

St. Ignace
and
Mackinaw,
Mich.

FOR SALE at a Bargain.

The tug Henry—Cylinders, 16½x18; new steel boiler; steel boiler house; hull in first-class condition. This is a most favorable opportunity to procure a first-class tug for dredging outfit. For particulars apply to

WILLIAM TRUBY,

Fairport Harbor, O., where tug can be seen.

For Sale

By The Middletown & Portland Bridge Co., the following boats lately used by them for the ferry over the Connecticut river, connecting Middletown and Portland.

Steamer Brownstone:

91 ft. long, 40 ft. beam, draws 6 ft. of water; tonnage 253 gross and 127 net; burns about 1½ tons of coal per 15 hours; fitted with two condensing engines; speed about 9 miles per hour.

Steamer Gildersleeve:

60 ft. long, 15 ft. beam, draws 4 ft. of water; tonnage 23 gross, 22 net.

Have with same, 1 large scow and two landing bridges.

The whole are in good condition, having been lately used by us, but as we have no use for them, their place being taken by a bridge.

THE MIDDLETOWN & PORTLAND BRIDGE CO.

F. L. WILCOX, Treas.

East Berlin, Conn.

FOR SALE

The Steam Car-ferris "HURON"

and "INTERNATIONAL"

Owned by the Grand Trunk Railway Company.

	"HURON"	"INTERNATIONAL"
Length over all	239 ft.	225 ft.
Beam	44 "	40 "
Depth of hold	14 "	12 "
Draft, loaded	11 "	10 "

Both boats are built of iron, and are equipped with twin screws, with independent engines and boilers.

Particulars may be obtained from A. B. ATWATER or H. ROBERTS, Grand Trunk Railway, DETROIT, MICH.

The United States Standard Register of Shipping.

Providing the only Standard Classification based on Construction Rules
Designed for Lake Vessels.

Classed Vessels Receive the Lowest Rates of Insurance.

SURVEYORS.

SINCLAIR STUART, Surveyor of Iron and Steel Construction and Engineer Surveyor.

Surveyor for District comprising Lakes Superior, Michigan and Huron and Lake Erie, as far East as, and including Cleveland, O.

EDWARD CASKIN, Potter Building, Main Street, Buffalo, N. Y., Surveyor for District comprising Lake Ontario and Lake Erie, as far West as, but not including Cleveland, O.

Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

The United States Standard Steamship Owners', Builders' & Underwriters' Ass'n, Ltd.
Post Building, 16 and 18 Exchange Place, NEW YORK.

FOR SALE CHEAP

Excursion Steamer

"CORNONA"

Capacity 1100 Passengers.

(Day Boat.)

FOR FULL INFORMATION APPLY TO

WOODLAWN BEACH CO., 27 Lewis Bldg., BUFFALO, N.Y.

The COAST LINE to MACKINAC

TAKE THE



TO

MACKINAC
DETROIT
PETOSKEY
CHICAGO

2 New Steel Passenger Steamers

The Greatest Perfection yet attained in Boat Construction—Luxurious Equipment, Artistic Furnishing, Decoration and Efficient Service, insuring the highest degree of

COMFORT, SPEED AND SAFETY.

FOUR TRIPS PER WEEK BETWEEN

Toledo, Detroit & Mackinac

PETOSKEY, "THE SOO," MARQUETTE, AND DULUTH.

LOW RATES to Picturesque Mackinac and Return, including Meals and Berths. From Cleveland, \$18; from Toledo, \$15; from Detroit, \$13.50.

EVERY EVENING

Between Detroit and Cleveland

Connecting at Cleveland with Earliest Trains for all points East, South and Southwest and at Detroit for all points North and Northwest.

Sunday Trips June, July, August and September Only.

EVERY DAY BETWEEN

Cleveland, Put-in-Bay & Toledo

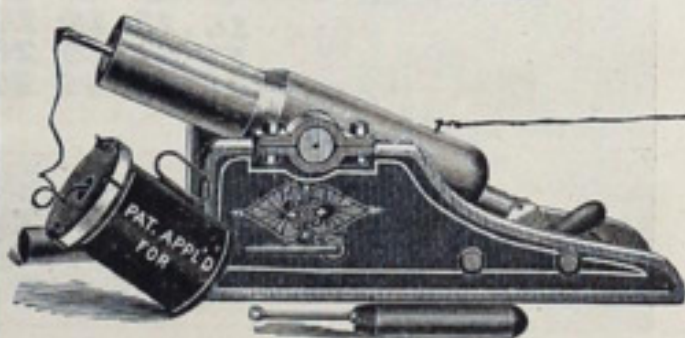
Send for Illustrated Pamphlet. Address

A. A. SCHANTZ, G. P. A., DETROIT, MICH.

The Detroit and Cleveland Steam Nav. Co.

Lyle Line Carrying Gun.

ESTABLISHED 1826.



For Steamships and Tow Boats

of best Bronze Gun Metal and FACSIMILE of the Government Regulation Line saving Gun, mounted on handsome iron carriage and complete with PATENT REEL for Line, and accompaniments, furnished by us to the "Cunard," the "Pacific Mail," "Warren Line," "Cramps of Philadelphia," "Philadelphia and Reading Co." "Leyland," "Atlantic Transport," and many other steamship lines.

This gun is of superior quality and conforms to full Government tests. Can be used for salutes as well as for life saving, also is invaluable for throwing a line to a wreck at sea. Also fine Bronze Yacht Guns—all kinds.

Send for Circular and Price List.

Also "Scotts," "Wesley Richards," and all makes FINE HAMMERLESS DOUBLE GUNS, and every article in the line. Send for our catalogue.

WILLIAM READ & SONS

107 Washington St. BOSTON.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.
320 ATWATER STREET,
DETROIT, MICH.

NORTHERN STEAMSHIP CO.
GREAT NORTHERN RAILWAY LINE.

MR. CHARLES DALE,
President Peerless Rubber Mfg. Co.
New York City.

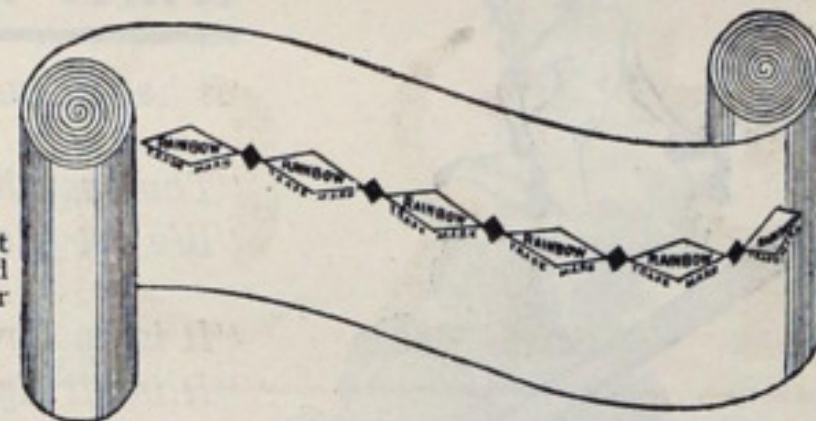
On board Steamship North Land, September 12, 1895

DEAR SIR:

I have used Rainbow Packing for steam and hot water pressures of 266 lbs. and 500 to 600 lbs. respectively, and find it superior to all others. Before using Rainbow Packing I tried various other packings, including corrugated copper, and found that they would not hold. I therefore tried Rainbow Packing and can cheerfully recommend it as being the only packing for all high pressures in the market to-day.

Respectfully yours,

HENRY J. REYNOLDS, Chief Engineer Steamship North Land.



RAINBOW

Is the only Packing in the World that will
Successfully hold High Pressures.

BEWARE OF IMITATIONS.

MANUFACTURED EXCLUSIVELY BY

THE PEERLESS RUBBER MFG. CO.

16 WARREN ST., NEW YORK.

FOR SALE BY THE LEADING SHIP CHANDLERS AND SUPPLY HOUSES.

BAR IRON

THE BOURNE-FULLER CO.

CLEVELAND, O.

PIG IRON

BOILER RIVETS, BOILER TUBES, IRON PIPE,

SALES AGENTS:

THE CARBON STEEL CO.

MANUFACTURERS OF

OPEN HEARTH STEEL

SHIP, BOILER, BRIDGE AND
TANK PLATES, &c., &c.

BOAT SPIKES,
CLINCH RINGS, &c.

HIGH GRADE MATERIALS FOR
VESSEL CONSTRUCTION
A SPECIALTY.

SALES AGENTS:

THE CAMBRIA IRON CO.

MANUFACTURERS OF

OPEN HEARTH

AND BESSEMER STEEL

ANGLES, BARS, CHANNELS,
BEAMS, TEES, ZS, &c.

De Grauw, Aymar & Co.,
34-35 South Street,
NEW YORK, N. Y.



Sole Selling Agents
in the
United States
for

**TYZACK'S
STOCKLESS ANCHORS**

Over 40
of these Anchors
on Lake Vessels.

The McIntosh-Huntington Co.,
CLEVELAND, O.

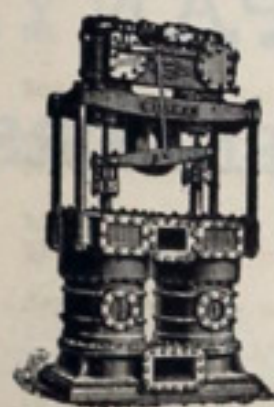
PENBERTHY INJECTORS,
DAVIS PRESSURE REGULATORS,
RAINBOW PACKING,
VALVES AND FITTINGS. VACUUM PACKING.

THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

MARINE PUMPS

Single and Duplex Pumps for Boiler Feed,
Fire or Bilge Service—Vertical and Horizontal.
Vertical and Horizontal Pumps, Air Pumps
for Surface and Jet Condensers.



AIR PUMP ON
U.S. CRUISER NEW YORK.

95 and 97 Liberty St., NEW YORK.

Bethlehem Iron Company

PRINCIPAL OFFICE and WORKS:

SOUTH BETHLEHEM, PENNA.

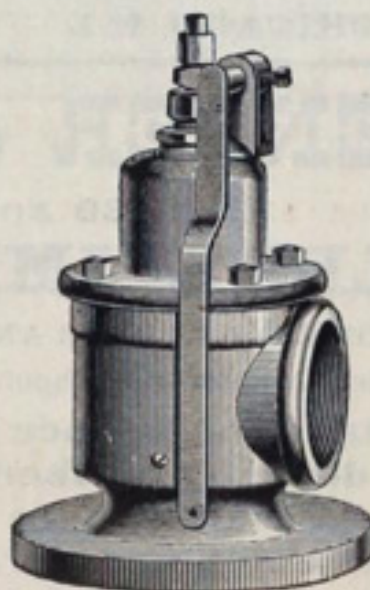
Steel Forgings

of all descriptions

For Marine Engines

Fluid Compressed, Hollow, Hydraulic Forged
and Annealed Forgings a Specialty.

NEW YORK OFFICE, - - 100 Broadway.
PHILADELPHIA OFFICE, - 421 Chestnut St.
CHICAGO OFFICE, - - Marquette Bldg.



CROSBY STEAM GAGE AND VALVE CO.,

Sole Proprietors and Manufacturers of

Crosby Pop Safety Valves and Water Relief Valves. Crosby Improved Steam Gages, Single Bell Chime Whistles, Patent Gage Testers, Victory Lubricators, and other specialties.

The Crosby Steam Engine Indicator, when required, is furnished with Sargent's Electrical Attachment, by which any number of diagrams can be taken simultaneously.

BRANDEN PUMP VALVES, rubber with wire-coil insertion. Manufacturers of all kinds of Pressure and Vacuum Gages, Water Gages, Gage Cocks, Radiator Cocks, and other Engine and Boiler Fittings and Supplies.

Branch Offices at New York, Chicago and London,
Main Office and Works at BOSTON, MASS

Bertram's Oil Polish, The Marine Polish of the World.

U.S. government in the marine departments. For sale by ship chandlers and engineers supplies stores.

For Brass and all Metal Surfaces it is unequalled. It is cheaper, requires less work and retains its brilliancy longer than any metal polish made. Acknowledged the standard of excellence by the BERTRAM OIL POLISH CO., 220 & 22 State St., BOSTON, MASS.

CLEAN BOILERS MEAN LOW FUEL ACCOUNTS.

The Empire Boiler Cleaning Co.'s System of Boiler Treatment.

WHAT THEY SAY OF IT: * **CLEANS AND KEEPS THE BOILER CLEAN, PREVENTS SCALE, CARROSION AND PITTING.**

"It has accomplished all that the parties have claimed for it."

Frank Soop, Supt. Engineer, New Haven Steamboat Co.

"The best that we have found for the purpose."—The Bartholomay Brewing Co., Rochester, N.Y.

"We are pleased to recommend it to anyone owning a steam plant."

The Enterprise Printing Co., Cleveland, O.

"It is by far the best that we have ever used."—The Mahoning Valley Iron Co., Youngstown, O.

"It is all right."—H. C. Doman, Oshkosh, Wis.

"The system is a most economical one, and one that recommends itself to a well posted boiler man."

Thomas Shehan, formerly Chief Engineer, Mutual Trans. Co., Cleveland, O.

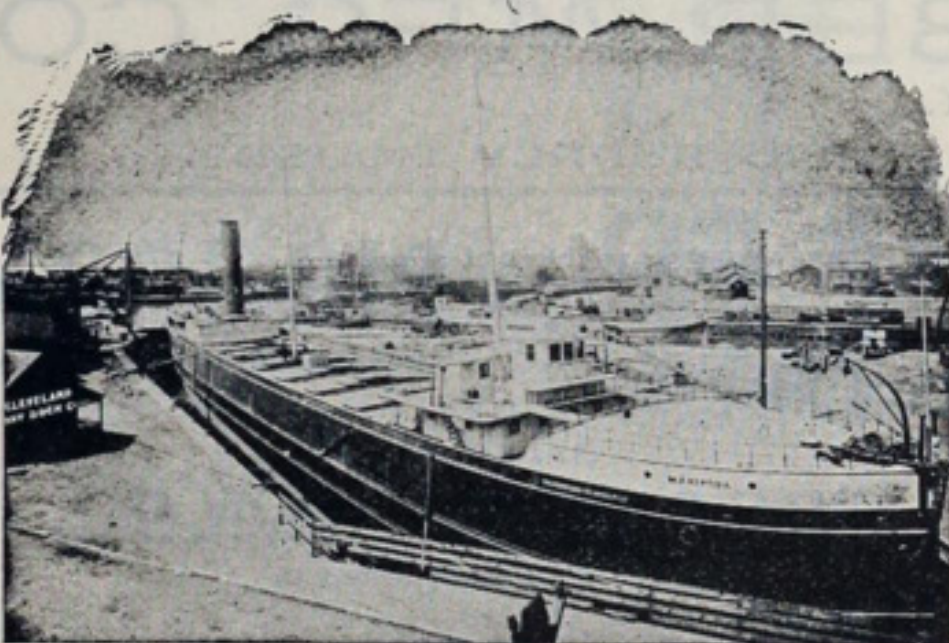
Full information furnished upon application.

TELEPHONE 2241

ALEX C. BATES Agent, Wade Bldg., Cleveland, O.



The Cleveland Dry Dock Co.



148 Elm St.,
Cleveland, O.

Telephone 1616.
Resid. Phone 4080.

REPAIRING A SPECIALTY.

Dimensions of Dock:
Lth. over all, 360 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

Capt. W. W. BROWN
Sec'y & Mgr.

H. W. Johns' Boiler and Pipe Coverings.

ASBESTOS
MATERIALS
OF
ALL KINDS.

Wicking,
Fibre,
Mill Board,
Felt,
Packing,
Cement,
Liquid
Paints,
Roof Paints,
Fire-Proof,
Paints, etc.

Made in Sections Three Feet Long, to Fit
Every Size of Pipe.

ABSOLUTELY FIRE-PROOF.



THE CHASE MACHINE CO.
111 ELM ST. CLEVELAND, O.

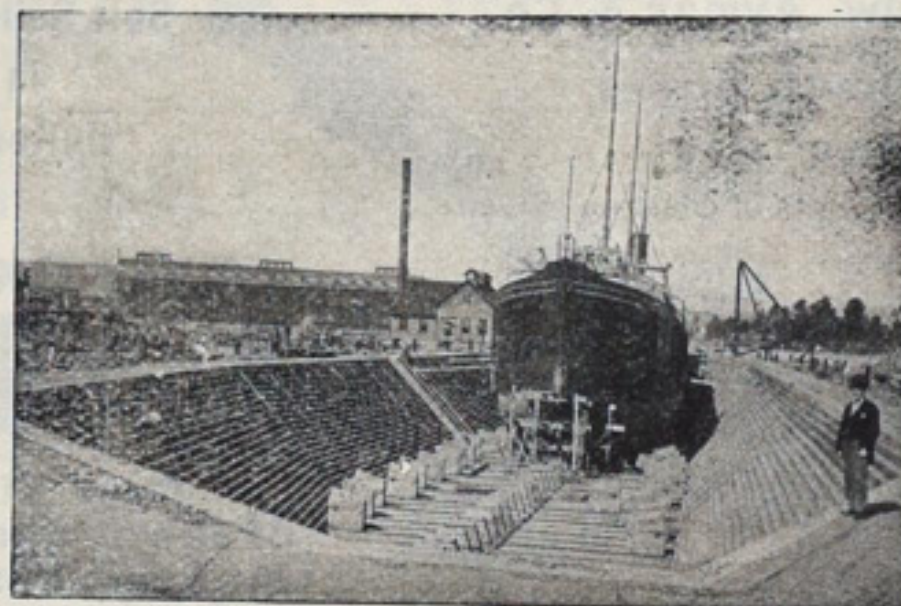
H. W. JOHNS MFG. CO.
32 SOUTH WATER ST.

AMERICAN STEEL BARGE CO. STEEL and METAL SHIPS

Of all classes built on the Shortest Possible Notice at our yards at
West Superior, Wis., and also at Everett, Wash.

Photograph of 300 ft. Boat in Dock.

Plates &
Material
Always
on hand
to Re-
pair all
kinds of
Metal
Ships in
Shortest
Time.



Best
Quality
of Oak
in stock
for Re-
pairing
Wooden
Vessels
of all
Classes

SIZE OF DOCK.

Length, extreme.....	537 feet.	Entrance, Top.....	55 feet 9 in.
Breadth, Top.....	90 " 4 in.	Entrance, Bottom.....	50 "
Breadth, Bottom.....	52 "	Depth over Sills.....	18 "

LARGEST DRY DOCK ON THE LAKES.

Prices for Repairs and Docking same as at lower lake ports
SUPERIOR, WIS.

A number of Propellor Wheels in stock at Dry Dock.



ALKALI WATER PURIFIER!

A Pure Chemical for the safe Removal and Prevention of Scale in Steam Boilers In use by many of the larger Steamship lines on the great Lakes. Guaranteed

MANUFACTURED BY

THE J. H. PARSONS CHEMICAL CO.,
1509 Masonic Temple. CHICAGO, ILL.

WHEELER CONDENSER & ENGINEERING COMPANY,

39 and 41 CORTLANDT STREET, NEW YORK.

WHEELER'S IMPROVED SURFACE CONDENSERS

MOUNTED UPON COMBINED AIR AND CIRCULATING PUMPS.

Sole Proprietors and Manufacturers of the

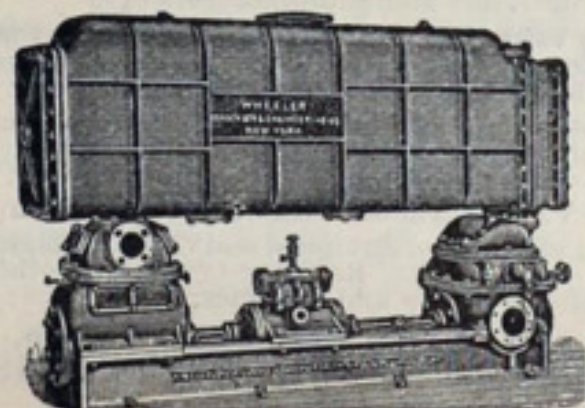
Wheeler Standard Surface Condenser.

Wheeler Admiralty Surface Condenser.

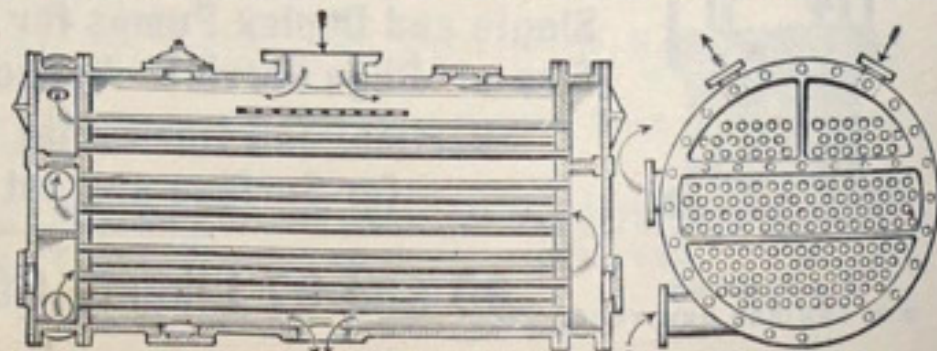
Wheeler Lighthall Surface Condenser.

Volz Patent Combined Surface Condenser
and Feed Water Heater.

Wheeler's Improved Marine Feed Water Heater.



Wheeler Surface Condenser.
Mounted on Combined Air & Circulating Pumps.



Patent Combined Surface Condenser & Feed-Water Heater.